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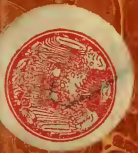

Virginia, Its climate, soil, productions, manufacturing industries and mineral wealth.

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SMITHSONIAN DEPOSIT.

VIRGINIA;

ITS

Climate, Soil,

PRODUCTIONS,

Manufacturing Industries,

AND

MINERAL WEALTH.

∴ PUBLISHED BY THE ∴

NORFOLK & WESTERN RAILROAD COMPANY,

For gratuitous distribution in the interest of emigration
to the State of Virginia.

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A Great Railroad System.

The Norfolk & Western Company affords a shining example of how a railroad may help itself by promoting the industrial development of the country through which it passes.

If it had been content to subsist upon the mere patronage which came to it with the purchase of the franchises of the Atlantic, Mississippi & Ohio Railroad—of which it is the successor—it would have doomed itself to a scant livelihood and its owners to poor returns. But from the beginning its policy has been progressive. It has been the leader in nearly all of the great enterprises which have proved to the world that the vast wealth long believed to be hidden along and about our mountain ranges was something more than a dream.

It has induced thousands of people from other States and other countries to turn their eyes towards Virginia. It has not merely met enterprise with enterprise, but in the great majority of instances, through friends and supporters, has inaugurated and established them.

In a land as rich as ours such a policy could have but one result. With such a stimulating influence exerted over almost half the State it is no wonder that we see a new Virginia in the territory of the Norfolk & Western system—a new Virginia, with all the hearty, hospitable, and manly characteristics of the old time, and all the hopefulness, energy, and organization of the new.

This activity has invited new-comers to the State and made it the interest of residents to remain rather than venture their fortunes in distant homes. This has given to the company the popular title of "town-builder." This has made it a blessing to us and a valuable property to its owners.

The Norfolk & Western's first step was to put its road and equipment in first-rate order, and now, no matter where you take one of its trains, you are charmed with the comfort and elegance of the cars, the civility of the officials, and the smoothness and celerity with which you move over the track and leave mile-posts behind you. Neat stations and beautiful hotels are passed on every hand, and the wayfarer who once complained that there was "nowhere about a decent place to stop," now finds himself passing inns of exquisite architecture, standing in the midst of lawns and groves or on busy streets, furnished with all the elegance that the age demands, and presenting bills of fare which tempt the daintiest appetite. It is the good fortune of the road, or system of roads rather, to lie in a picturesque country, embracing exquisite views of bays, and rivers, low-lands and uplands, and mountains and valleys, and to have on one of its lines three of the great natural wonders of the United States—the Natural Bridge, the Grottoes, and the Luray Caverns.

Having gotten its road properly ordered, the next move of the company was to encourage the home people and to attract strangers. The results show how well directed were their efforts. The first thrill of new industrial life that this State received came from the regions on the line of the Norfolk & Western; there its genesis was and there the new-found prosperity has been made permanent by the opening of ore and coal beds, the building of furnaces and factories, and the assembling of large communities of desirable wage-workers. As long as the road remains to carry these products to the markets waiting to receive them, the good done Virginia and West Virginia will be patent to the dullest observer. Facts speak with more emphasis than the most eloquent language when we are authoritatively told that "the last year's industrial improvements on the Norfolk & Western Railroad lines were 12 blast furnaces, 8 rolling mills, 68 foundries and machine works, 85 wood-working establishments, 151 other manufacturing plants, 43 iron mines, 9 coal mines, 2,600 coke ovens, 45 hotels, besides street railways, electric plants, water and gas works, schools, &c. The works in contemplation, some of which will probably be begun this year, almost equal in number those just completed."

For convenience we have spoken of the Norfolk & Western as one company and one line, when in fact several are combined in one. It never adopted the policy of leasing roads. It always bought or built. It deserves the title of "road-builder" as well as of "town-builder," and all the States bounding Virginia, and many on and beyond the Ohio river, are now feeling, or soon will begin to feel, the quickening influence that accompanies its entrance into a community.

To-day much of our space is devoted to an exhibit of the history and achievements of the Norfolk & Western, and of the industrial development in that large section which is its tributary territory.

It is a grand showing for the old Commonwealth; a brilliant tribute to the wisdom and enterprise of the Norfolk & Western's owners and managers. We can afford to wish it well when our State is a sharer in all its prosperity.—*From Richmond (Va.) Dispatch, March 25, 1891.*

PRESIDENT HARRISON ON THE PAST, PRESENT AND FUTURE OF VIRGINIA.

President Harrison, on his recent tour through the Southern States, passed over the line of the Norfolk & Western Railroad from Lynchburg to Bristol, passing through the growing cities and towns of Lynchburg, Bedford City, Roanoke, Salem, Radford, Pulaski, Max Meadows, Wytheville and Abingdon. The results of his observations are shown in his address to the citizens of Bristol, Va. and Tenn., on his arrival at that point, which is given below:

"*My Fellow Citizens*—I have found not only pleasure, but instruction in riding to-day through the portion of the State of Virginia that is feeling in a very striking way the impulse of new development. It is extremely gratifying to notice that those hidden sources of wealth which were so long unobserved and so long unused are now being found, and that these regions, once so retired, occupied by pastoral people, having difficult access to the center of population, are now being rapidly transformed into busy manufacturing and commercial centers. In the early settlement of this country emigrants poured over the Alleghanies and Blue Ridge like waters over an obstructing ledge, seeking the fertile and attractive farm regions of the great West. They passed unobserved these marvelous hidden stores of wealth which are now being brought into use.

"Having filled those great basins of the West, they are now turning back to Virginia and West Virginia and Tennessee to bring about the full development and production for which time is ripe and which will surprise the world. It has not been long since every implement of iron, domestic, agricultural and mechanical, was made for you in other States. The iron point of the wooden mold board plow, with which the early farmers here turned the soil, came from distant States. But now Virginia and Tennessee are stirring their energies to participate in a large degree in mechanical productions and in the great awakening of American commerce and American influence which will lift the nation to a place among the nations of the world never before attained

"What hinders us, secure in the market of our own great population, from successful competition in the markets of the world? What hinders our people, possessing every element of material wealth and endowed with inventive genius and energy unsurpassed, from again having upon the seas merchant marine flying the flag of our country and carrying its commerce into every sea and every port? I am glad to stand for this moment among you; glad to express my sympathy with you in every enterprise that tends to develop your State and local communities; glad to stand with you upon one common platform of respect to the constitution and law, differing in our politics as to what law should be, but pledged with common devotion to obedience to law, as the majority shall by their expressions make it.

"I shall carry away from here new impulse to public duty, new inspiration as a citizen with you of a country whose greatness is only dawning, and may I now express the pleasure I shall have in every good that can come to you as a community and to each of you as individuals. May peace, prosperity and social order dwell in all your communities, and the fear and love of God in every home."

VIRGINIA.

The history of no other State has more to appeal to the imagination and the judgment than that of Virginia—a history romantic, heroic and august. What shapes trod her early stage! No experiences of age dispel the charms of her bright romance. No aspiring historian, panting after the iconoclasm, can destroy these idols of childhood. Smith and Pocahontas will be always real and dear; and the sounds of the names of some of her rivers make melodies in our ears now as they did in young and day-dream days. But if her early history is so dear for the charms it gave our childhood there are eras, in the contemplation of which veneration is the fittest mood. Her soil seems hallowed with the ashes of the best and bravest of our countrymen. She seems an "eternal camping-ground" for fame; and the spirits of her warriors and statesmen crowd their sacred trysting-place—a numerous and immortal concourse. There reposes all that mortality can claim of one of the most revered of Christian warriors and statesmen—Washington. In the soil of Virginia rests the immortal author of the Declaration of Independence—Thomas Jefferson. There, too, lies Patrick Henry, one of the most kindling and enthralling orators of any time. There is buried Randolph, of Roanoke, the fierce and fiery tribune, whose "splendid conflagration" illumined in his day the most august forum of his country—the United States Senate. But who shall call the long roll of heroes in proper tones?

Her generous bounty gave to the nation long ago a large area. Lately she was dismembered by cutting off from her what is now West Virginia; but she is still not only a noble and glorious, but a great State. She is now on a new path of progress, and her bowels yearn to endow the State with a vaster wealth in her minerals than has ever been drawn from her bosom by agriculture.

Virginia lies in latitude 36° 33′ to 39° 27′ north, corresponding to Southern Europe, Central Asia, Southern Japan and California. Its longitude is from 75° 13′ to 80° 37′ west from Greenwich. On the south it adjoins North Carolina for 326 miles and Tennessee for 114 miles, making the line of the State from the Atlantic west 440 miles; on the west and northwe t, Kentucky for 115 and West Virginia (by a very irregular line) for 450 miles, form the boundary. Maryland is northeast and north, separated by the Potomac river and the Chesapeake bay for 205 miles from Virginia, and by a line of 25 miles across the Eastern Shore. East and southeast it is bordered by the Atlantic for 125 miles. The boundary lines of the State measure about 1,400 miles. On the northwest they are mostly mountain ranges, on the northeast and east water. The longest line in the State, from the Atlantic southwest to Kentucky, is 476 miles; the longest from north to south is 192 miles.

The State has an area of land surface of 40,125 square miles, and a water surface estimated at 2,325 square miles. The population, according

to the census of 1880, was 1,512,565, an average of 38 to the square mile. Of this number 880,858 were white and 631,616 colored.

There are six great natural divisions of the territory of Virginia—belts of country extending across the State from northeast to southwest, as a general direction, nearly parallel to each other, and corresponding to the trend of the Atlantic coast on the east, and of the ranges of the Apalachian system of mountains on the northwest. These grand divisions are, taken in the order of succession from the ocean northwest across the State: 1st. The Tidewater Country; 2d. Middle Virginia; 3d. The Piedmont Section; 4th. The Blue Ridge Country; 5th. The Great Valley of Virginia; 6th. The Apalachian Country. These divisions not only succeed each other geographically, but they occupy different levels above the sea, rising to the west like a grand stairway. They differ geologically also; therefore they have differences of climate, soil, productions, &c., and require a separate consideration in every respect in a description of the State.

Tidewater Virginia is the eastern and southeastern part of the State that on the south borders North Carolina 104 miles; on the east has an air-line border of 120 miles along the Atlantic; on the west is bounded by 150 miles of the irregular outline of the Middle Country—(this would be 164 miles if it took in the mere edge of the Tidewater along the Potomac up to Georgetown.) The shore line of the Potomac river and the Chesapeake bay for 140 miles, and a line of 25 miles across the Eastern Shore, separate it from Maryland on the north. The whole forms an irregular quadrilateral, averaging 114 miles in length from north to south, and 90 in width from east to west, making an area of some 11 000 square miles.

The latitude is from 36° 33′ to 38° 54′ north, corresponding to that of the countries bordering on the northern shores of the Mediterranean in Europe, and to the central belt of States—Kentucky, Missouri, California, &c.—in the United States. The longitude is from 75° 13′ to 77° 30′ west from Greenwich—that of Maryland, Central Pennsylvania and New York, in the United States, and Ontario, in Canada, on the north, and of North Carolina, the Bahamas, Cuba, &c., on the south.

This is emphatically a tidewater country, since every portion of it is penetrated by the tidal waters of Chesapeake bay and its tributary rivers, creeks, bays, inlets, &c., which cover some 2,300 square miles of surface, and give nearly 1,500 miles of tidal shore line. The united waters of nearly all this section, with those that drain 40,000 more square miles of country, or the drainage of 50,000 square miles, (an area equal to that of England,) flow out through the channel, 12 miles wide, between Capes Charles and Henry—the "Virginia Capes"—into the Virginian sea of Captain John Smith, along the eastern border of which, 50 or 60 miles from the land, runs the ever-flowing Gulf Stream.

Tidewater is naturally divided into nine principal peninsulas, and these are sub-divided into a great number of smaller ones, giving a wealth of outline not even surpassed by the famous Morea of Greece; in truth, there are here dozens of Moreas. These peninsulas are, politically, each divided into counties, (thirty in all,) most of them laid out and named when this, the first settled portion of English-speaking America, was a British colony, and the names given them were those of the counties or worthies of England, the "Mother Country" at the time.

The first peninsula, taking them from the north to the south, is the

Northern Neck, 75 miles long and from 6 to 20 wide, extending southeast from the Middle Country to the bay, between the Potomac and Rappahannock. Its counties are King George, Westmoreland, Richmond, Northumberland and Lancaster. This peninsula is almost surrounded by navigable waters.

The second, or Middlesex Peninsula, extends southeast for 60 miles, with a breadth of from 3 to 10, between the Rappahannock and the Piankitank rivers, including Essex and Middlesex counties. The Rappahannock is navigable all along one side, and the Piankitank nearly half of the other. This is one of the short peninsulas succeeding a long one.

The third, or Gloucester Peninsula, reaches southeast from the Middle Country, between the Piankitank and the York and its extension, the Mattapony, some 70 miles to the bay, where it is "forked" by the Mobjack Bay. Its width is from 6 to 18 miles. It includes King & Queen, Mathews and Gloucester Counties.

The fourth, the King William or Pamunkey Peninsula, a short one, extends 60 miles southeast, between the Mattapony and the Pamunkey, (the streams that form the York.) This is from 3 to 14 miles wide, and includes the counties of Caroline and King William, although the former extends across the neck of the third peninsula to the Rappahannock.

The fifth, a long one, is known as "The Peninsula," by way of eminence, as it was the first settled; and Williamsburg, its chief town, was the colonial capital of Virginia. This stretches 100 miles to the southeast, with a width of from 5 to 15 miles, between the Pamunkey and its extension, the York, on the north, and the Chickahominy and the continuing James on the south. This large peninsula extends from the Middle Country to the bay, and looks out between "The Capes." Its counties are Hanover, New Kent, James City, York, Warwick and Elizabeth City.

The sixth, the short, Richmond or Chickahominy Peninsula, between the Chickahominy and the James, is 50 miles long and from 5 to 15 wide, divided into Henrico and Charles City Counties. The former contains Richmond, the capital of Virginia.

The seventh, or Southside Peninsula, embraces all the country south of the James, and between it and the Nansemond River and the North Carolina line. This is the last peninsula trending to the southeast, which it does for 64 miles, with a width of from 35 to 40. Its counties are Prince George, Surry, Sussex, Southampton, Isle of Wight and Nansemond.

The eighth is the Norfolk Peninsula, including the counties of Norfolk and Princess Anne—the territory between the Nansemond River, Hampton Roads, Chesapeake Bay and the Atlantic—some 30 by 35 miles in extent, protruding northward.

The ninth, the Eastern Shore, is the peninsula extending to the south between Chesapeake Bay and the Atlantic, divided between the large counties of Accomac and Northampton.

The last two are the Upper Tertiary Plain, raised but from 20 to 30 feet above the sea level, composed of north and south-lying belts of smaller peninsulas and islands, with the "pocoson" ends of the other peninsulas, forming the first step of the ascending stairway or terraces of Virginia to the westward. The shifting sands of its ocean shore are often elevated into dunes more than 100 feet high.

The seven other peninsulas, with all their masses extended southeast

and northwest, rise up as the second and third steps. The second step, corresponding in the main to the middle tertiary formation, attains an elevation of from 80 to 120 feet above the sea. This is the widest tidewater terrace, gashed and broken by the broad estuaries that flow through it. The third step has its eastern edge just west of the meridian of 77°, and attains an elevation of from 90 to 150 feet above the sea, occupying the belt of lower tertiary country. Beyond this rises the fourth step, the border of granite and sandstone elevated from 150 to 200 feet above the sea, forming the rocky barrier over which the waters of the Middle or ' upper country " fall, and up to which the tides of the "low country" come, making the "head of tide" for the Atlantic slope, and furnishing sites for manufacturing and commercial cities, where water-power for manufacturing and tide power for commerce are found side by side. Here, half in Tidewater and half in Middle, on the fourth step and on the level of the first, on the hills and below them, are Petersburg, Richmond, Fredericksburg and Alexandria.

The Tidewater Plain, then, has an average width of nearly 100 miles, and rises in three successive terraces to an elevation of about 150 feet. It is a fine, rolling, low country, with a surface diversified by salt-water marshes and meadows, river bottoms, plains, upland, slopes and ridges, with a moderate proportion of "pocoson" or swamp country.

The MIDDLE COUNTRY extends westward from the "head of tide" to the foot of the low, broken ranges that, under the names of Catocton, Bull Run, Yew, Clark's, Southwest, Carter's, Green, Findlay's, Buffalo, Chandler's, Smith's, &c., mountains and hills, extend across the State southwest, from the Potomac, near the northern corner of Fairfax County, to the North Carolina line, near the southwest corner of Pittsylvania, forming the eastern outliers of the Apalachian system, and that may with propriety be called the Atlantic coast range.

The general form of this section is that of a large right-angled triangle, its base resting on the North Carolina line for 120 miles; its perpendicular, a line 174 miles long, extending from the Carolina line to the Potomac, just east of and parallel to the meridian of 70° 30′ west, is the right line along the waving border of Tidewater which lies east; the hypothenuse is the 216 miles along the Coast Range, before mentioned, the border of Piedmont, on the northwest—the area of the whole, including the irregular outline, being some 12,470 square miles.

The latitude of this section is from 36° 33′ to 39°; the longitude 70° to 79° 40′ west. So its general situation and relations are nearly similar to those of Tidewater.

The Middle Country is a great, moderately undulating plain, from 25 to 100 miles wide, rising to the northwest from an elevation of 150 to 200 feet above tide, at the rocky rim of its eastern margin, to from 300 to 500 along its northwestern. In general appearance this is more like a plain than any other portion of the State. The principal streams, as a rule cross it at right angles; so it is a succession of ridges and valleys running sontheast and northwest, the valleys often narrow and deep, but the ridges generally not very prominent. The appearance of much of this country is somewhat monotonous, having many dark evergreen trees in its forests. It needs a denser population to enliven it. To many portions of the Middle Country the mountain ranges to the west, of the deepest blue, form an agreeable and distant boundary to the otherwise sober landscape. There are a few

prominences like Willis', Slate River and White Oak Mountains farther east, only prominent because in a champaign country.

There can be but little natural grouping of the political divisions of the Middle Country, since there are but few great natural landmarks, unless James River, which crosses this section at right angles nearly midway, be considered as one, and the twenty-five counties of Middle Virginia be grouped as northside and southside ones. Many of these counties were laid out, named and settled in colonial times also, and some of the oldest settled portions of the State are here.

The northside counties are Fairfax, Alexandria, Prince William and Stafford, bordering on the Potomac; Spotsylvania between the Rappahannock and North Anna, Louisa on the south of the North Anna, (portions of Caroline, Hanover and Henrico properly belong here,) Fluvanna and Goochland on the James—making 8 northside counties.

The seventeen southside counties are Buckingham, Cumberland, Powhatan and Chesterfield, between the James and Appomattox rivers; Appomattox, on the James, Prince Edward, Amelia and Dinwiddie, south of the Appomattox, and the two latter between it and the Nottoway, (Nottoway is north of the river of that name;) Campbell between the James and Staunton (or Roanoke) rivers, Charlotte north of the Roanoke, Lunenburg between the Nottaway and Meherrin, Brunswick and Greensville extending from the Nottaway across the Meherrin to the North Carolina line, (a portion of the latter county is in Tidewater;) Pittsylvania and Halifax reach from Staunton across the Banister and the Dan to the North Carolina line, and Mecklenburg extends from the Meherrin across the Roanoke to the same boundary.

Portions of Fairfax, Prince William, Stafford, Spotsylvania, Caroline, Fauquier, Culpeper, Hanover, Henrico, Goochland, Powhatan, Chesterfield, Buckingham, Cumberland, Prince Edward, Campbell and Pittsylvania, which are on the triassic, or new red sandstone formation, differ considerably in appearance from the rest of the Middle Country which is on the eozoic, or granite, gneiss, &c., rocks.

This section is essentially the same as the rest of the eozoic belt that extends from the Alabama River to the St. Lawrence, embracing large portions of the best sections of Alabama, Georgia, South Carolina, North Carolina, Maryland, Pennsylvania, New York, and all the New England States. The cities of Atlanta, Raleigh, Petersburg, Richmond, Fredericksburg, Alexandria, Washington, Baltimore, Philadelphia, New York, New Haven, &c., are situated, in whole or in part, on these rocks.

PIEDMONT VIRGINIA is the long belt of country stretching for 244 miles from the banks of the Potomac and the Maryland line southwest, along the eastern base of the Blue Ridge Mountains, and between them and the Coast Range, to the banks of the Dan at the North Carolina line; it varies in width from 20 to 30 miles, averaging about 25; its approximate area is 6,680 square miles.

Its latitude corresponds with that of the State 36° 33′ to 39° 27′ north; its longitude is from 77° 20′ to 80° 50′ west.

This Piedmont Country is the fifth step of the great stairway ascending to the west; its eastern edge, along Middle Virginia, is from 300 to 500 feet above above the sea; then come the broken ranges of the Coast Mountains, rising as detached or connected knobs, in lines or groups, from 100 to 600

feet higher. These are succeeded by the numberless valleys, of all imaginable forms, some long, straight and wide; others narrow and widening; others again oval and almost enclosed, locally known as "Coves," that extend across to and far into the Blue Ridge, the spurs of which often reach out southwardly for miles, ramifying in all directions. Portions of Piedmont form widely extended plains. The land west of the coast ranges is generally from 300 to 500 feet above the sea, and rises to the west, until at the foot of the Blue Ridge it attains an elevation of from 600 to 1,200 feet. The Blue Ridge rises to from 2,000 to 4 000 feet above the sea; at one point near the Tennessee line, it reaches a height of 5,530 feet; its general elevation is about 2,500, but its outline is very irregular.

Numerous streams have their origin in the heads of the gorges of the Blue Ridge, and most of them then flow across Piedmont to the southeast until near its eastern border, where they unite and form one that runs for a considerable distance along and parallel to the Coast Mountain, and takes the name of some of the well-known rivers that cross Middle and even Tidewater Virginia, like the Roanoke or Staunton, and the James. Some of these rivers break through the Blue Ridge from the Valley, making water gaps in that formidable mountain barrier, as the Potomac, the James and the Roanoke; but they all follow the rule above given in their way across this section.

This is a genuine "Piedmont" Country—one in which the mountains present themselves in their grand as well as in their diminutive forms—gradually sinking down into the plains, giving great diversity and picturesqueness to the landscape, with its wealth of forms of relief as varied by those of outline in Tidewater. Few countries surpass this in beauty of scenery and choice of prospect, so it has always been a favorite section with men of refinement in which to fix their homes. Its population is 31 to the square mile, giving some 21 acres for each.

The political divisions of Piedmont are fourteen. Some of its counties have long been settled, and are highly improved. There are no natural groupings possible for these counties; they all, with three exceptions, run from the summit of the Blue Ridge across this belt of country. Taking them from the Potomac, the counties are: Loudoun, watered mostly by Goose and Catoctin Creeks and the Potomac; Fauquier, drained by the Rappahannock waters, to which river it extends; Rappahannock and Culpeper, on the southwest side of the same stream, Culpeper reaching to the Rapid Anne, as does also Madison; Green and Orange, southwest of the Rapid Anne; Albemarle, drained by the Rivanna and Hardware Branches of James and reaching to the James; Nelson and Amherst, bounded by the Blue Ridge and the James, Amherst by that river, both southeast and southwest; Bedford and Franklin, southwest of the James, and drained chiefly by waters of the Roanoke or Staunton; Patrick and Henry, next the North Carolina line, furnishing many branches to the Dan. Every portion of this section is penetrated by watercourses and is well supplied with unfailing, bright, pure water, from springs and mountain rivulets.

The Blue Ridge Section, for two-thirds of its length of 310 miles, is embraced in the Valley and Piedmont counties that have their common lines upon its watershed; it is only the southwestern portion of it, where it expands into a plateau, with an area of some 1,230 square miles, that forms a separate political division; still the whole range and its numerous spurs,

parallel ridges, detached knobs and foot-hills, varying in width from 3 to 20 miles, embracing nearly 2,500 square miles of territory, is a distinct region, not only in appearance but in all essential particulars. The river, in the gorge where the Potomac breaks through the Blue Ridge, is 242 feet above tide. The Blue Ridge there attains an elevation of 1,460 feet. Mt. Marshall, near and south of Front Royal, is 3,369 feet high; the notch, Rockfish Gap, at the Chesapeake & Ohio Railroad, is 1,996 feet, and James River, where it passes through the Ridge, is 706 feet above tide, or more than twice as high as the Potomac at its passage. The Peaks of Otter, in Bedford County, are 3,993 feet, and the Balsam Mountain, in Grayson, is 5,700 feet, and in North Carolina this range is nearly 7,000 feet above the sea level. These figures show that this range increases in elevation as we go southwest, and every portion of the country near rises in the same manner. At a little distance this range is generally of a deep blue color. The whole mountain range may be characterized as a series of swelling domes, connected by long ridges meeting between the high points in gaps or notches, and sending out long spurs in all directions from the general range, but more especially on the eastern side, these in turn sending out other spurs giving a great development of surface and variety of exposure.

The political divisions upon the plateau of the Blue Ridge are the counties of Floyd, Carroll and Grayson, all watered by the Kanawha, or New River, and its branches, a tributary of the Ohio, except the little valley in the southwest corner of Grayson, which sends its waters to the Tennessee The population of this romantic section is 23 to the square mile.

The GREAT VALLEY OF VIRGINIA is the belt of limestone land west of the Blue Ridge, and between it and the numerous interrupted ranges of mountains, with various local names, that run parallel to it on the west at an average distance of some twenty miles, that collectively are called the Kitatinny or North Mountains. This valley extends in West Virginia and Virginia for more than 330 miles from the Potomac to the Tennessee line, and 305 miles of this splendid country are within the limits of Virginia. The county lines generally extend from the top of the Blue Ridge to the top of the second or third mountain range beyond the Valley proper, so that the political Valley is somewhat larger than the natural one, which has an area of about 6,000 square miles, while the former has 7,550, and a population of twenty-six to the square mile. The latitude of the Valley is from 36° 35′ N. to 39° 26′; its longitude is from 77° 50′ to 80° 16′ W.

While this is one continuous valley, clearly defined by its bounding mountains, it is not the valley of one river, or of one system of rivers, but of five; so that it has four water-sheds and four river troughs in its length, along the Valley from the Potomac to the Tennessee line. These valleys and their length in the Great Valley are, from the northeast—

1st.	The Shenandoah Valley	136 miles.
2d.	The James River Valley	50 "
3d.	The Roanoke River Valley	38 "
4th.	The Kanawha or New River Valley	53 "
5th.	The Valley of the Holston or Tennessee	52 "
		330 miles.

As a whole the Valley rises to the southwest, being 242 feet above the tide where the Shenandoah enters the Potomac and the united rivers break through the Blue Ridge at Harper's Ferry, and 1,687 feet where the waters of the Holston leave the State and pass into Tennessee. The entire Valley

appears then as a series of ascending and descending planes, sloping to the northeast or the southwest. That of the Shenandoah rises from 242 to 1,863 feet along the line of its main stream, in 136 miles, looking northeast; those of the James slope both ways, from the Shenandoah summit to the southwest, and from the Roanoke summit to the northeast, and so on. This arrangement gives this seventh great step a variety of elevations above the sea from 242 to 2,594 feet, or even to 3,000, in a great enclosed valley, subdivided into very many minor valleys, giving "facings" in all directions; for the whole Valley has a very decided southeastern inclination, to be considered in this connection, its western side being from 500 to 1,000 feet in surface elevation above its eastern, presenting its mass to the sun, giving its streams a tendency to flow across it toward the east, as the result of its combined slopes, and making the main drainage way hug the western base of the Blue Ridge. A moment's reflection will show that this is a well watered country, having a wealth of water-power and drainage and irrigation resurces almost beyond estimate.

The aspect of this region is exceedingly pleasant. The great width of the Valley; the singular coloring, and wavy, but bold outline of the Blue Ridge; the long, uniform lines of the Kitatinny mountains, and the high knobs that rise up behind them in the distance; the detached ranges that often extend for many miles in the midst of the Valley like huge lines of fortification—all these for the outline, filled up with park-like forests, well cultivated farms, well built towns, and threaded by bright and abounding rivers, make this a charming and inviting region.

The fifteen counties of the Valley—its political divisions—are naturally grouped by the river basins, to which their lines generally conform.

The noted *Shenandoah Valley* has, in Virginia, in the northeast Frederick and Clarke counties, reaching from the North mountains to the Blue Ridge across the Valley, watered by the Opequon creek and the Shenandoah river and branches; Shenandoah county, extending from the mountains west to the Massanutton range, that for 50 miles divides the Valley into two, one watered by the North and the other by the South Fork of the Shenandoah; Warren, that lies at the confluence of these forks and between the Massanutton and the Blue Ridge, and Page county, between the same mountains and intersected by the South Fork; Rockingham, a large and noted county, reaching across the whole Valley, and holding the sources of the North Fork; and Augusta, the largest county, also occupying the width of the Valley, and containing the head springs of the Shenandoah. These seven counties occupy the whole of this well-known, fertile and wealthy Valley.

In the *Valley of the James* are Rockbridge and Botetourt, two fine counties in the heart of the Valley, both extending across it, the former watered by the North and South rivers of the James, and that river and other tributaries, and the latter by the much-developed James river and Catawba, Craig's and other creeks. The mountain scenery of Rockbridge is especially noted.

In the *Valley of the Roanoke* is the small but rich county of the same name; portions of Botetourt and Montgomery are drained by that river also.

The *Kanawha* or *New River Valley* has Montgomery, Pulaski and Wythe counties, famous ones for grazing and stock, that reach from mountain to mountain.

In the *Valley of the Holston* or *Tennessee* are the two fine counties of Smyth and Washington, with soils of rare fatness.

Apalachian Virginia succeeds the Valley on the west. It is a mountain country, traversed its whole length by the Apalachian or Alleghany system of mountains. It may be considered as a series of comparatively narrow, long, parallel valleys, running northeast and southwest, separated from each other by mountain ranges that are, generally, equally narrow, long and parallel, and quite elevated. In crossing this section to the northwest, at right angles to its mountains and valleys, in 50 miles one will cross from 6 to 10 of these mountain ranges and as many valleys. As before stated, a strip of this region is embraced in the Valley counties, as they include the two or three front ranges that have drainage into the Valley; so that some 900 square miles of Apalachia are politically classed with the Valley, leaving 5,720 square miles to be treated of here. This, in Virginia, is an irregular belt of country 260 miles long, varying in width from 10 to 50 miles. Its waters, generally, flow northeast and southwest, but it has basins that drain north and northwest, and south and southeast. The heads of the valleys are generally from 2,000 to 2,800 feet above tide, and the waters often flow from each way to a central depression—that is, from 600 to 1,200 feet above sea level—before they unite and break through the enclosing ranges. The remarks made concerning the slopes of the Great Valley apply also to this section, except that the Apalachian valleys are straighter.

The twelve counties of this section group very well as follows:

1st. The James River group, the waters from which flow into that river, including Highland, on the water-shed of the James and Potomac, the South Branch of the latter having several of its sources there, with the Cowpasture and Jackson's River branches of the former; Bath, crossed by the same branches of the James; Alleghany, through a portion of which the same rivers flow, and in which they unite, meeting the waters of Dunlap's and Pott's Creeks from the southwest; and Craig, drained by Johns', Craig's and Barber's Creeks, flowing from the southwest. Sinking Creek of New River flows southwest from this county. All these waters but the last run into the James before it crosses the Valley.

2d. The Kanawha or New River group includes Giles, which is intersected by New River, into which flow from the northeast Sinking and Big and Little Stony Creeks, and from the southwest Walker's and Wolf Creeks; Bland, on the head waters of Walker's and Wolf Creeks, just mentioned, and having also some of the springs of the Holston, that flows southwest.

3d. The Tennessee River group, on the waters of that river, embraces Tazewell, on the divide of New and Tennessee, (the lowest gaps of which are 2,116 feet above tide); Wolf Creek, Bluestone and East Rivers run from this county northeast into New River, while the North and the Maiden Spring Forks of Clinch flow southwest; Russell is southwest of Tazewell, and the Clinch and its Copper and Moccasin Creek branches run through it to the southwest; Scott is next, and the same streams pass through it from Russell, and the North Fork of the Holston besides, all running southwest; Lee is southwest of Scott, Powell's River and its numerous branches flowing southwest from it to the Clinch. All these waters unite in the State of Tennessee, and form the river of that name. The land of the counties of this group is exceedingly fertile, large portions of it being limestone: and

its exposure to the southwest, and the situation and elevation of its surrounding mountains, secure to it a very mild climate.

4th. The Sandy River group includes Buchanan County, drained by the Tug, Louisa and Russell's Forks of the Big Sandy, flowing northwest, and Wise County, drained by Russell's and Pound Forks of the same river, and a portion by the Guest's River branch of the Clinch, and some head springs of the Powell's River. These two counties really belong to the Trans-Apalachian Country, the great plain that slopes from the parallel ranges of mountains to the northwest, from which the waters have eroded their deep channels. They cover Virginia's part of the great carboniferous formation, and give her a most valuable coal field.

Apalachia is noted as a grazing country, its elevation giving it a cool, moist atmosphere, admirably adapted, with its fertile soil, to the growth of grass and the rearing of stock of all kinds.

Inland Waters.—The State has two systems of inland waters—(1) the Atlantic and (2) the Ohio or Mississippi.

(1.) The waters of the State, from Tidewater, Middle, Piedmont, the eastern slope of the Blue Ridge and central part of the Valley, flow southeast to Chesapeake Bay and Albemarle Sound, following the inclination of the "Atlantic slope." Those from the northern portions of the Valley and Apalachia follow the mountain ranges northeast to the Potomac, which river follows the southeasterly course before mentioned.

(2.) The waters from the southwestern part of the Blue Ridge, the middle of the southwestern half of the Valley and Apalachia, flow northwest and north to the Ohio; those of the southwestern portions of the Valley and Apalachia flow southwest to the Tennessee. So the waters of the State flow in all directions.

Principal Rivers and Branches.—The waters belonging to the Atlantic system drain six-sevenths of the State. The principal streams of this system are: The Potomac, a wide and deep river, the northeastern boundary of Virginia, with its large branches—the Shenandoah and the South Branch and its prominent smaller ones, Potomac Creek, Occoquan River, Broad Run, Goose, Catoctin and Opequon Creeks, draining a large area of each of the sections of the State. The Potomac is navigable for 110 miles from where it enters the bay, some 65 miles from the ocean. It has many landings, and lines of steamers and sailing vessels connect them with all portions of the country, giving great facilities for cheap transportation to a very extensive and valuable portion of the Northern Neck. The Rappahannock, with its Rapid Anne and numerous other branches flowing from the Blue Ridge across Piedmont, Middle and Tidewater, irrigating a large territory. The Rappahannock is navigable to Fredericksburg, 92 miles from its mouth at the bay, some 40 miles from the ocean. The Piankitank, draining only a portion of Tidewater, is navigable for some 14 miles; and Mobjack Bay and its rivers furnish deep entrances to the Gloucester Peninsula. The York, with its Pamunkey and Matapony branches, and many tributaries flowing from a considerable area of Middle and Tidewater. The York is a wide, deep and almost straight *belt* of water, reaching over 40 miles from the bay to the junction of the Pamunkey and the Matapony, which are themselves navigable for many miles for light-draught vessels. The James, with the Chickahominy, Elizabeth, Nansemond, Appomattox, Rivanna, Willis', Slate, Rockfish, Tye, Pedlar, South, Cowpasture, Jackson's and many other

inflowing rivers and streams of all kinds, gathers from a large territory in all the divisions, draining more of the State than any other river. The James is navigable to Richmond. The Elizabeth is a broad arm of the Hampton Roads estuary of the James, extending for 12 miles, the last four of which are expanded as the superb harbor between the cities of Norfolk and Portsmouth. All these flow into Chesapeake Bay. The Chowan, through its Blackwater, Nottoway and Meherrin branches and their affluents, waters portions of Middle and Tidewater Virginia. The Roanoke receives the Dan, Otter, Pig, and many other streams from the Valley, Piedmont and Middle Virginia, and then flows through North Carolina to Albemarle Sound, joining the Chowan. The sources of the Yadkin are in the Blue Ridge.

The waters of the Ohio, a part of the Mississippi system, drain the remaining seventh of the State; but they reach the Ohio by three diverse ways. The rivers are: The Kanawha or New River, that rises in North Carolina, in the most elevated portion of the United States east of the Mississippi, flows through the plateau of the Blue Ridge, from which it receives Chestnut, Poplar Camp, Reed Island and other creeks and Little River; across the Valley, where Cripple, Reed and Peak's Creeks join it; across Apalachia, from which Walker's, Sinking, Big and Little Stony and Wolf Creeks and East and Bluestone Rivers flow into it, and then through West Virginia into the Ohio, having cut through the whole Apalachian system of mountains, except its eastern barrier, the Blue ridge. The Holston, through its South, Middle and North Forks, Moccasin Creek, &c., drains the southwestern portions of the Valley and Apalachia; and the Clinch, by its North and South Forks, Copper Creek, Guest's and Powell's Rivers, and many other tributaries, waters the extreme southwest of the Apalachian Country. These flow into the Tennessee. A portion of the mountain country gives rise to the Louisa and Russell's Forks of the Big Sandy River, and to some branches of the Tug Fork of the same river, the Tug forming the Virginia line for a space. These flow into the Ohio by the Big Sandy.

These are but a few of the thousand or more named and valuable streams of Virginia. They abound in all portions of the State, giving a vast quantity of water-power, irrigating the country, furnishing waters suited to every species of fish, giving channels for tide and inland navigation, and enlivening the landscapes. Springs are very numerous, many of them of large size. Nearly every portion of the State is well watered.

GEOLOGY.

The geological formations found in Virginia, like its geographical divisions, succeed each other in belts, either complete or broken, nearly parallel to the coast of the Atlantic. In fact, the geographical divisions of the State that have already been given, correspond in the main to the different geological formations, and have been suggested by them; hence, those divisions are natural.

The formations developed in Virginia, taken in the order in which they succeed each other and cover the surface, or form the rocks found with the surface, from the Atlantic at the Virginia capes to the northwest across the State, are as follows:

Tidewater.—1. Quarternary; 2. Upper Tertiary; 3. Middle Tertiary; 4. Lower Tertiary. *Middle.*—5. Triassic and Jurassic; 6. Azoic and Granitic.

Piedmont.—7. Azoic, Epidotic, &c. *Blue Ridge.*—8. Azoic and Cambrian. *The Valley.*—9. Cambrian and Silurian. *Apalachia.*—10. Sub-carboniferous and Devonian; 11. Silurian; 12. Devonian and Sub-carboniferous; 13. Great Carboniferous.

TIDEWATER.—This is what the geologists call a tertiary or lately formed region—one where the remains of plants and animals found in the rocks and soils do not differ greatly from the plants and animals now living; they belong to the same families. The beds of mineral substances here found are rarely converted into real rocks, but lie as beds of sand, gravel, clay, &c., much the same as when they were deposited in shallow waters by the ocean or inflowing rivers.

1st. *The quarternary or post-tertiary* formation is the sandy shore, the mere margin, of the Atlantic and the bay. It is like the shore land of Lincolnshire and other eastern counties of England.

2d. *The upper tertiary or pliocene* is the first step or terrace of the State above the ocean. It is the low plain of the Eastern Shore and Norfolk Peninsula, where the surface is composed of "light-colored sands and clays, generally of a fine texture, and never enclosing pebbles of large dimensions. This is, geologically, a similar country to most of Suffolk in England, to the hills of Rome in Italy, and the territory around Antwerp in Belgium. Underneath this are found the other formations in order, and their valuable marls can be reached at no great depth by going through this. The immense piles of shells found along the shores and the refuse fish furnish fertilizers adapted to the soils of this section.

3d. *The middle tertiary or miocene* is the surface of the second step of country, extending from the western border of the last-described formation, where this passes under that, to a line running southward from Mathias Point, on the Potomac, to Coggin's Point, on the James—a line just west of the meridian of 77°. From the James south it inclines to the west. This formation generally, descending from the surface, consists of the following materials:

1. Beds of coarse sand and gravel just under the soil, sloping in position.
2. Horizontal beds of sand and clay.
3. Yellow marl, underlaid by a conglomerate of fragments, with shells nearly entire, but water-worn.
4. Yellow marl, with friable shells and tenacious clay.
5. Upper blue marl—a clay, bluish, of fine texture, rich in shells.
6. Lower blue marl—clay with more sandy materials, more shells and more varieties.
7. A thin band of pebbles, with ferruginous matter—the bottom of the formation.

In some parts of Tidewater some of these strata harden into a sort of limestone or into sandstone, very good for building purposes. Of course, the lower tertiary underlies this as this underlies the upper, and is overlapped by it. This formation covers a large portion of the Atlantic plain and of the Lower Mississippi Valley of the United States; it is the formation of the valley of the Columbia in Oregon and of the valleys of California; in Europe it forms the Gironde and Landes of France and the basin of Vienna; in England it is the New Forest Region of Hampshire and Dorset, the country around Portsmouth and Southampton.

4th. *The lower tertiary or eocene.* This formation underlies both the

others, and forms the surface of the remainder of tidewater west of the line already described as forming the western boundary of the middle tertiary. It is a strip of country some 15 miles wide along the "head of tide." The fossils found in this are more unlike the forms now existing. This green-sand marl formation on the east pushes its headlands into the middle tertiary, and on the west fills up the ravines between the headlands of sandstone, granite, &c., that protude into it from the Middle Country.

The following section, from the banks of the Potomac below Aquia Creek, will give an insight into the composition of this group of "rocks:"

(1.) The soil.
(2.) 20 feet of yellow clay, impregnated with sulphates.
(3.) 5 feet of sulphur-colored clay, containing shells.
(4.) 3 feet of rock, resembling marl in color and composition.
(5.) 12 feet of yellowish gray marl, specked with green sand and — abounding in shells.

40 feet, the level of the Potomac.

In some places the marl of this eocene contains so much carbonate of lime from the shells distributed through it, it has become a limestone. Here are also beds of blue marl, shell-rock, gypseous and acid clays, dark bluish clay and sand containing sulphates of iron and lime. There are also beds of sand and gravel, coarse and often cemented by iron. In all of these there is great variety of color and composition. The strata are slightly inclined, generally to the southeast. This is the formation on which the most of Essex, Middlesex, Kent, &c., counties around London in England, are situated—the region of the noted London clay. (The same material abounds in Virginia.) The Isle of Wight, Dorset, Wilts, Hants, Suffolk, Norfolk, Cambridge and Lincoln counties, the most productive in England, are in the lower tertiary; the cities of Liverpool and Paris are also on it.

5th. *The triassic or new red sandstone* is sometimes found as transported fragments from that formation, (which forms a part of the western boundary of this section,) scattered over the surface of some of the peninsulas southeast from where this rock is found in place.

6th. *The azoic or primary rocks*, which underlie all the others, and also form part of this western border, are sometimes found as headlands thrust into the tertiary or as islands in its surface.

Middle Country —The larger portion of this region is azoic or primary. The rocks contain no organic remains. They are crystalline in their character, generally stratified, dip at a high angle either to the southeast or the northwest, or are nearly vertical, rarely horizontal, and their exposed edges or "strike" run northeast and southwest. The strata vary in thickness from the fraction of an inch to many feet.

The rocks of this formation are: Gneiss, (a name given to any crystalline, stratified rock composed of quartz and felspar, mixed with smaller quantities of hornblende, mica or other simple minerals,) the most abundant, which along the east side of the Middle Country, is a gray rock consisting of quartz, felspar and black mica, with some spangles of white and grains of hornblende. This is the fine Richmond granite. In some of the layers of this rock the felspar predominates, and the rock crumbles on exposure. The finer grained gneiss is generally called granite; the coarser, syenite or syenitic granite. The former are quartzose; the latter felspathic. Next, going westward, are other varieties of gneiss more slaty in structure, con-

taining more felspar and hornblende, (quartz is the flint rock; felspar is softer and duller in color; hornblende is dark green or black,) and are more decayed, sometimes into beds of porcelain clay or kaolin. These are succeeded, on the western border of this section, by a broad belt of micaceous, talcose and argillaceous slates, according to the ingredient predominant in the rock, whether mica, talc, or soapstone or alumina. The rocks on the east side of this slaty belt are most micaceous; on the west, talcose. In these belts are some beds or small tracts of chloritic gneiss, slate, steatite, serpentine, &c., making spots noted for fertility like the Green Spring Country in Louisa County. In the more argillaceous part of this belt—the western side next to Piedmont—some of the slates become so sandy, they pass as sandstones or conglomerates, (gneissoid sandstones,) and among these are found roofing slates and a fragmentary belt of limestone. Through the centre of this region runs the "gold belt," where gold is found in quartz veins, interstratified with the other rocks. Here are also veins of various kinds of iron and copper ores. This formation covers large areas of valuable country in all parts of the world.

In this Middle Section, as before stated, laid over the other rocks, (the granitic ones,) or filling depressions in them, are a number of patches of the triassic and jurassic, or new red sandstone rocks, sometimes called the middle secondary, and generally known as "brownstone." The localities of this are (*a*) the "Richmond coal-field," a large oval area in Chesterfield, Powhatan, Goochland and Henrico Counties, inside Middle Virginia; (*b*) a small oval territory bordering Tidewater, between Ashland and Millford stations, on the Richmond & Fredericksburg Railroad, and nearly divided by it; (*c*) a long narrow strip bordering Tidewater from several miles south of Fredericksburg, on, along the west bank of the Potomac, to near Mount Vernon; (*d*) a large wedge, nearly 600 square miles, resting for some 20 miles on the Potomac, and extending southwest, between the Middle and Piedmont Sections, to its apex on the Rapid Anne, near Orange Court House, with a small outlying portion near that place, and extending beyond it towards Gordonsville; (*e*) a curved portion of land extending from Hampden Sidney College north through Farmville to Willis' River, and northeast along that river to near Cumberland Court House; (*f*) a narrow belt along James River from Scottsville, some 15 miles to the southwest; (*g*) a band of country some 60 miles long, extending from a point southeast of Campbell Court House southwest to the North Carolina line near Danville.

These rocks are of the kind known as sedimentary—composed of particles of sand and earth, and of pebbles derived from other rocks, and deposited by water where they now are. They are in strata, some of coarse conglomerate, with very large pebbles; others of finer material, making sandstones, slates and shales, generally dark brown or red in color, but sometimes gray, brownish gray or yellow, and greenish gray. They generally dip but little, being nearly horizontal. The "brecciated marble" of the Potomac is from this formation, as is also the "brownstone" from Manassas. In this formation are found remains of plants as lignite or coaly matter, and of fishes; and in the Richmond, Danville and Farmville portions are valuable beds of rich bituminous coal.

PIEDMONT is in the same region of primary, azoic or transition rocks as Middle, but they differ much in their characteristics.

The gneiss of Piedmont, from the Blue Ridge to the Southwest Moun-

tain, is usually of a darker color and coarser texture than that of Middle Virginia, and it has much more variety in its structure and composition. Generally, it contains more or less talc or chlorite, not much mica, and very often hornblende and iron pyrites—the latter a powerful agent in decomposing rocks, and, with hornblende, giving a red tinge to the soil, so that this is often called the "Red-land" District. Near the base of the Blue Ridge are belts of granitic gneiss; also belts of micaceous, chloritic, argillaceous and talcose slates, generally narrow, with bands and patches of limestone. The epidotic or greenstone rocks form the chief mass of the broken Southwest Mountain or Coast Range chain, the eastern border of Piedmont. These rocks are of a greenish hue, with crystals of epidote and quartz. They weather into a yellowish soil that changes into orange and red, and is always fertile. Bands of iron ores of various kinds, slates, soapstone, &c., are found throughout this section.

The BLUE RIDGE is the border land between the azoic, primary or transition rocks and the fossiliferous ones. Generally, its eastern flank and summit, and sometimes a good portion of the western slope, are composed of the epidotic rocks before mentioned—more highly epidotic than even those of Piedmont—and so it acquires peculiar geological characteristics. The epidote is found there compact, with quartz imbedded as amygdaloid, &c. Here are also beds of epidotic granite, of whitish granite and of syenite, with sandstones and slates of various kinds; but epidote is here more abundant than elsewhere, and this, by decomposing, makes the wonderful soil of this mountain range.

The western flank of the Blue Ridge is composed of the rocks of the Cambrian, Potsdam Sandstone, Primal, or Formation I of Professor Rogers; for by all these names is known the "close-grained white or light gray sandstone," with beds of coarse conglomerate, brown sandstones and brownish olive-colored shales, here found, that once made the eastern shore of a great ocean. In this formation are bands of specular iron ore and beds of hematite.

The VALLEY is the region of Cambrian and Lower Silurian rocks—Formations I, II and III of Rogers, or from Potsdam to Hudson River formations of New York, inclusive—a country mainly of limestone, slate and shale rocks, with a fertile soil and undulating surface. The section across the Valley through Staunton gives some thirty alternating bands of slates and limestones of various kinds—some magnesian, others silicious or rich carbonates; some compact, others flaggy or slaty, &c. Among these are beds of chert, iron ore, umber, lead, zinc, &c. This formation extends northward, and forms the rich Cumberland, Lebanon and other valleys of Maryland, Pennsylvania and New Jersey, the Hudson and Mohawk Valleys of New York, and the Champlain Valley of Vermont. Southwest it becomes the Valley of East Tennessee, and extends into Alabama, making a great central valley some 1,500 miles in length of unsurpassed fertility and productiveness. This formation underlies a large portion of Scotland, especially the southern and central parts; much of the area of Wales, and large districts in the west, southwest and northwest of England. It covers an extensive tract in Russia; is found in Spain, &c. The most fertile portions of New York, Ohio, Indiana, Kentucky, Wisconsin and Missouri are also underlaid by this rock.

Belonging to the Valley counties, (the lines of which extend to the

summit of the Blue Ridge, and cross often several ranges of the mountains west,) of course, we have the half of the summit and all the western slope of the Blue Ridge, already described. To it also, politically, will belong parts of the Upper Silurian and Devonian systems, that are more especially referred to in the account of the Apalachian Country. These form long ridges that rise up and run for great distances in the Valley, like the Massanutton and other mountain ranges, making barriers that divide the Valley lengthways into two parallel valleys. The rocks of the Valley generally dip to the southeast at a high angle. In some places there runs an axis through the Valley from which the rocks dip both ways—to the southeast and to the northwest—making an anticlinal. The upturned edges of the rocks strike or run northeast and southwest with the Valley.

Fragments of the sub-carboniferous formation are found along the western margin of the Valley, sometimes containing valuable beds of semi-anthracite coal, as in Montgomery, Augusta and other counties. This formation consists of conglomerates, shales, sandstones, &c.

The APALACHIAN COUNTRY, beginning with the mountains on the west side of the Great Valley, is occupied chiefly by the Upper Silurian and Devonian rocks from IV to IX inclusive. It also shows narrow outcrops of Lower Silurian and important areas of carboniferons rocks, comprising sandstones, slates, limestones, coal seams, &c. The sandstones hold up the high parallel ridges or chains of mountains that run unbroken for such long distances; the slates and limestones for the rich valleys between. In these rocks are great continuous bands of hematite and fossil iron ores, among the most abundant and valuable in the world.

The Devonian rocks (or old red sandstone—Rogers' VIII and IX; the corniferous, Hamilton, Chemung and Catskill groups of New York,) are found among those that have already been described, the convulsions of nature having exposed in successive ridges and valleys the different formations. Formation VIII is composed of slates and slaty sandstones that often appear as low serrated ridges. The slates are black, olive, green and reddish, sometimes with calcareous bands. Some of the shales contain copperas, alum and iron ore. Formation IX is known by its red slates and sandstones alternating with green, yellow, brown and dark gray shales and slaty sandstones, with some iron ore.

The sub-carboniferous rocks in Virginia, Formations X and XI, are confined to narrow belts made up of conglomerates, slates, shales and limestones, running along the southeast flanks of the North Mountains. It is in Formation X (Vespertine) that Rogers locates the coal of Augusta, Botetourt, Montgomery, &c. Formation XI is very calcareous, and is the repository of the gypsum and rocksalt of Southwest Virginia, (Rogers.) This is the equivalent of the carboniferous limestone of England. Great down-throws and upheavals of the rocks have brought the carboniferous and Silurian formations in the southwestern portion of Apalachia side by side, and all the intervening formations are often wanting. Iron ore of good quality is found in the shales of this group.

The carboniferous or true coal-bearing rocks, Rogers' XII to XV, cover but a moderate area in Virginia, when compared with that occupied by the other formations; still, the State has nearly a thousand square miles of territory that belongs to the great carboniferous in the southwest, in that portion of it lying north of the Clinch River and drained by its western

branches, and in the Virginia territory drained by the Sandy River, with some small adjacent areas. This formation is a group of sandstones, slates, bands of limestone and seams of coal, that together make the great Apalachian coal-field—one of the most remarkable in the world for the number, thickness, quality and variety of its seams of bituminous coal, and for their accessibility above water level.

The formations of the Apalachian District are the same as those that cover large portions of the States of New York, Pennsylvania, Ohio, Indiana, Michigan and Iowa. In Europe this formation occupies the Lowland Region of Scotland, the country of Edinburg and Glasgow; also the Cromarty and Caithness Region. In England it underlies large areas in the northwest and southwest, and in Wales.

CLIMATE.

Virginia, as a whole, lies in the region of "middle latitudes," between 36° 30′ and 39° 30′ north, giving it a climate of "means" between the extremes of heat and cold incident to States south and north of it.

If Virginia were a plain, the general character of the climate of the whole State would be much the same; but the "relief" of its surface varies from that of some of its large peninsulas not more than 10 or 15 feet above the sea level, to that of large valleys more than 2,000 feet above that level. Long ranges of mountains from 3,000 to 4,000 feet in height run entirely across the State, and the waters flow to all points of the compass. So diversified are the features of the surface of the State, within its borders may be found all possible exposure to the sun and general atmospheric movements. It follows from these circumstances that here must be found great variety of temperature, winds, moisture, rain and snowfall, beginning and ending of seasons, and all the periodical phenomena of vegetable and animal life depending on "the weather."

The winds are the great agents nature employs to equalize and distribute temperature, moisture, &c. Virginia lies on the eastern side of the American Continent, and on the western shore of the Atlantic Ocean. It extends to and embraces many of the ranges of the Apalachian system of mountains that run parallel to that ocean shore; therefore it is subject not only to the general movement of winds, storms, &c., from west to east, peculiar to the region of the United States, but to modifications of that movement by the great mountain ranges. It is also subject to the great atmospheric movements from the Atlantic that, with a rotary motion, come up from the tropics and move along the coast, extending their influence over the Tidewater and Middle Regions of the State; sometimes across Piedmont to the foot of the Blue Ridge, but rarely ever over or beyond that range. It has also surface winds, usually from the southwest, that follow the trend of the mountains and bring to them and their enclosed parallel valleys the warmth and moisture of the gulf that clothes them all with an abundant vegetation.

The same causes that produced the magnificent forests of the carboniferous era and furnished the materials for the vast deposits of coal in the 60,000 square miles of the great Apalachian coal-field that flanks Virginia on the west, still operate and clothe the surface of the same region with an abundant vegetation. The laws of the winds make one region fertile and

another barren. America owes its distinction as the Forest Continent to the situation of its land masses in reference to the prevailing winds.

The mean annual temperature for the State is 56°; for the Tidewater Region, 58°; for the Middle and Piedmont, 35.60°; and for the Valley, 54°. The average mean temperature of the State for January is 42°, and for July 78°.

The notable points about the climate are, first, its range—from that of the southeastern low plain, fronting the Atlantic and tempered by it, to that of the high mountain plateaus of the northwestern margin, where cold temperature conditions prevail; second, its mildness, on the whole, notwithstanding this considerable range; third, its dryness, although the rainfall is abundant, and, compared with most European countries, large. The climate is healthful and favorable to a great variety of agricultural products.

The rainfall is next in importance to the temperature in the climate of a country, for heat and moisture are the two great requisites for abundant production when a fertile soil is present.

Guyot, a standard authority, says: "North America has in the eastern half a greater amount of rain than either of the other northern continents in similar latitudes." * * "The great sub-tropical basin of the Gulf of Mexico sends up into the air its wealth of vapors to replace those lost by the winds in crossing the high mountain chains. Hence the eastern portions—the great basins of the Mississippi and the St. Lawrence and the Apalachian Region—which, without this source of moisture, would be doomed to drought and barrenness, are the most abundantly watered and the most productive portions of the continent." "In the eastern half of the United States the southwesterly winds which prevail in the summer spread over the interior and the Atlantic plains an abundant supply of vapors from the warm waters of the gulf. Frequent, copious showers refresh the soil during the months of greatest heat, which show a maximum of rain. Thus the dry summers of the warm-temperate region disappear, and with them the periodical character of the rains so well marked elsewhere in this belt."

These quotations show the advantages Virginia has, in this respect, over the warm-temperate regions of Europe and elsewhere.

As to mean annual rainfall, nearly the whole State lies in a zone of from 40 to 45 inches.

SOILS.

The character of the soils of Virginia, as of other countries, is dependent on its geology.

TIDEWATER is a tertiary region. Its soils are the alluvial deposits—the sands and clays peculiar to that formation. The soil of the low, flat, sandy shores and islands is, naturally, thin, light and soft. At the same time it is warm, and, under the influences of a mild climate, a near ocean and bay, and the dense crops of wild bent-grass, magothy bay-beans, &c., that grow and decay upon it, it becomes very productive and "quick." The salt marshes of this region are rich in the elements of fertility, as is evidenced by the crops of grass they produce. The soil of the Eastern Shore Peninsula is like that already described, only it rests upon a stiff clay, and so retains fertilizers applied to it and is easily improved. The soils of the Norfolk Peninsula also belong to this class. They are light, warm, easily tilled, and respond quickly to the influence of fertilizers. All these may be

characterized as garden soils, adapted to the hoe. In all this upper tertiary country there is much salt-marsh and swamp land that, when properly drained, becomes exceedingly productive.

In every portion of Tidewater along the streams are "first" or alluvial bottoms, composed of mixed materials, the sediment of the waters. These, where above tide, or where protected by embankments, have a perpetual fertility.

The second bottoms, or second terrace above the waters, are called the "rich lands" of the country. They "are composed of loams of various qualities, but all highly valuable, and the best soils are scarcely to be surpassed in their original fertility and durability under severe tillage." The subsoil is a dark red or yellow clay—the yellow becoming of a chocolate color on exposure—lying not very deep. These soils are drier and stiffer than those of the first bottom. Sometimes they are sandy; but all are susceptible of improvement.

In some places there are spots of "shelly" soil, where the remains of oysters, mussels, &c., have decomposed and mingled with the loam and sand. These are permanently fertile, bringing forth abundantly. "Shelly" soils could be made anywhere in this region, for Providence has bountifully supplied the means by which this "hint" may be taken advantage of.

The first and second bottoms are not far above the water level, and form a comparatively small portion of the country. They are succeeded by the "slope"—the incline that reaches back to the ridge or water-shed of the peninsulas. The soil of these slopes, compared with that on the flat ridges, "is of a higher grade of fertility, though still far from valuable; * * * "generally more sandy than the poorer ridge land," and, when exhausted by injudicious cultivation, inclined to wash during rains. "The washing away of three or four inches in depth exposes a sterile subsoil." Sometimes these soils are productive, but, as a rule, do not wear. That they are not wanting in some of the elements of fertility is well shown by the dense growth of pine trees that speedily covers them when abandoned by severe cultivation. Though thin, sandy and poor, and considered as almost valueless, these lands have been made fertile by using the marl and shells that are near by. The same can be done again. There is a large area of this land.

"The ridge lands are always level and very poor, sometimes clayey, more generally sandy, but stiffer than would be inferred from the proportion of silicious earth they contain, which is caused by the fineness of its particles." These evils "vary between sandy loam and clayey loam." Numerous shallow basins are found in these soils which are filled with rain water in winter and dry in summer.

The soils of the MIDDLE COUNTRY vary, of course, as the rocks do which they overlie. In a work on the Geology of New Jersey, speaking of a similar region in that State, it says: "Hitherto the country in which they* are found has been considered poor and little capable of improvement. But gradually the farmer has been encroaching upon them, and turning these unpromising hills into fruitful fields. It is observed that the rocks are in many places subject to rapid decay, and that in such localities the soil is susceptible of high cultivation." This report then gives an analysis of three

*The azoic rocks.

varieties of felspar common in the composition of the rocks there, and also in Middle Virginia, with the following results:

	SODA FELSPAR.	POTASH FELSPAR.	SODA AND LIME FELSPAR.
Silica	68.6	64.6	62.1
Alumina	19.6	18.5	23.7
Soda	11.8	....	.. .
Potash	....	16.9	....
Lime	....	....	14.2
	100.0	100.0	100 0

It has been found that the soda and the soda and lime felspars are more easily decomposed than the potash ones. It will readily appear that a soil containing the ingredients shown in the table must have the elements of fertility; and since there are numerous and wide belts of these in this section, we find here upon these fertile and productive soils. Along the streams also the transported materials of these easily decomposed rocks have been deposited, giving everywhere rich soils in the "bottom" lands. Where the beds of gray or light brown slate occur, the soil is not productive; but it has been found that lime renders the soil from these fertile. Wherever the rocks contain epidote, they decompose into a very fertile soil of a deep red hue. Sometimes these rocks cover considerable areas; and we find these noted for their fertility, like portions of Louisa, Buckingham, and other counties of this section. There are also calcareous soils found in various portions of the Middle Country, where the patches of limestone before mentioned occur. These are always fertile. Some of the red soils of this section are derived from gneiss rocks containing sulphuret of iron, but not epidote. Such soils are as noted for sterility as the epidotic ones are for fertility.

The soils of the triassic or new red sandstone belts are generally fertile and easily worked. The composition of these rocks in New Jersey shows what they furnish to make a good soil. The red shale of the triassic at Brunswick, N. J., gave, by analysis, the following results:

Silicic acid and quartz	73.00
Peroxide of iron	10.00
Alumina	3.20
Lime	4.93
Magnesia	0.90
Potash	0 73
Soda	0.97
Sulphuric acid	a trace
Water	1.00

Other analyses of other rocks from this formation indicate the presence of a considerable percentage of lime, potash, soda, sulphuric acid, alumina, silica, &c., &c., all valuable ingredients of fertile soils. As a rule, the soils on the areas of this formation are among the best in this section.

The soils of PIEDMONT and of its southwest mountain border are much more epidotic in their character, and therefore naturally more fertile than most of those farther east.

The red or chocolate-colored soils of this section, formed from the decomposed dark greenish-blue sandstone here found, is generally considered the most fertile. This sandstone contains several per cent. of carbonate of lime. The other soils of this region are grayish or yellowish. These are by no means as fertile as the darker soils; but there are red soils here, as in Middle Virginia, that are also poor ones, and for the same reasons. The epidotic rocks, from which the best soils of this region are formed, often contain, says Rogers, 24 per cent. of lime. Hornblende, in decomposing,

forms a red soil also that is very fertile, but it contains magnesia, and less lime and alumina.

The soils of Piedmont are, many of them, undoubtedly among the most fertile known, and can be made to produce a great variety and abundance of crops. They are loose and easily worked, but care must be exercised in their management, since they are easily washed away by heavy rains. If neglected, they are soon covered by a growth of underbrush.

The Blue Ridge is composed of much the same materials as Piedmont, only they are richer in their abundance of greenstone rocks, which impart to the soils of this much expanded mountain range a wonderful fertility, and adapt them to the growth of rich grasses, vines, orchards and all the usual crops of the country, wherever the character of the surface admits of cultivation.

The soils in the sandstone belt of the western slope of this range are sandy and poor.

The soils of the Great Valley are quite numerous. They are generally called limestone soils, as this is a limestone region. The prevailing soil is a stiff, clayey loam—a durable and fertile soil well adapted to the growth of grass and grain. In the slaty belts the admixture of the decomposed aluminous rocks makes a lighter and warmer soil. There are also belts of sandy or gravelly soil that are cold, and require cultivation and fertilizers to make them productive, but once redeemed, they yield very well. Much the larger portion of the Valley has, naturally, a good soil, rich in the elements of fertility. The soil, like the rocks, runs in belts, with the Valley, and the lean ones are the smaller number. The streams, as in all limestone regions, are very winding; so there is here a considerable area of bottom lands.

The soils of the Apalachian Region are very marked in their character. The sandstone ridges and mountains are very poor, while those made up of limestones and some of the shales are very rich. Some of the slate valleys have a thin and poor soil; others on limestone or certain red sandstones are very rich. Indeed, the natural exuberant fertility of some of these broad ridges and narrow valleys is something wonderful. Some of the little valleys are appropriately called "gardens." This region is so penetrated by streams that it has everywhere alluvial lands.

Thus it appears that there are soils of every variety in Virginia suited to all kinds of productions.

In Tidewater—peat-bottom, or swamp and savanna lands, for cranberry culture; salt marshes and meadows for grass and cheap grazing; river marshes that reclaimed are fine hemp lands; plains, with soft and warm soil, for great market gardens and the rearing of delicate fruits; river bottoms—marly alluvial lands—excellent for cotton, corn, wheat, oats or meadows; thin, sandy uplands for great sheep pastures and for forest planting.

In Middle—clay soils that produce the finest of wheat; mixed sand and clay, well suited to general agriculture; thin lands, where fruit growing would be remunerative; rich low grounds, where great crops of Indian corn and rank tobacco grow from year to year without exhausting their fertility; light soils, where the finer kinds of tobacco are produced; lands for swedes, mangolds, &c., and improved sheep husbandry.

In Piedmont—rich upland loams unsurpassed as wheat or tobacco lands, and producing heavy crops of cultivated grasses; low grounds, where the

corn crop is always good, and where heavy shipping tobacco comes to perfection; lighter soils, where the vine and the apple produce abundantly; the best of lands for dairies, and for sheep and cattle rearing.

In the BLUE RIDGE, where the natural grasses invite to sheep and cattle grazing, and the rich, warm soil and sunny exposures are adapted to fruit culture on lands that elsewhere would be too valuable for the plow.

In the VALLEY—the natural blue-grass lands, the home of the stock-raiser and dairyman; the heavy clay lands, fat in fertilizing ingredients, always repaying the labor spent on them in crops of corn or wheat; the lighter slaty lands, famous for wheat crops; the poorer ridge lands, where sheep rearing should be followed.

In the MOUNTAIN REGION are great cattle ranges—lands where grass grows naturally as soon as the trees are cleared away and the sunlight admitted; rich meadow lands in the valleys well suited to dairying; fat corn or tobacco lands along the streams; lands for root crops along the slopes and on the plateaus.

PRODUCTIONS.

ANIMAL PRODUCTS.—The climate of Virginia is favorable for the growth and the products of its soil for the sustenance of animal life, consequently it has an abundant and vigorous native fauna on its land and in its waters. All the varieties of domestic animals reared in temperate climates have here found a congenial habitation, and excellent breeds of horses, mules, milch cows, working oxen, beef cattle, sheep, swine, goats and poultry abound in all sections of this State.

The cost of producing a given quantity of butter and cheese is much less in Virginia, owing to its milder climate and longer seasons, than in many other States of the Union. The statistics of production show the effects of elevation above the sea of portions of the State, giving them more adaptability to natural grasses and to the dairy business.

Sheep have always thriven in Virginia, and the wool here grown has an established reputation for excellence of quality. Wherever the business of rearing sheep, for wool or for mutton, has been judiciously conducted, it has proven remunerative. Few States have as many special adaptations for sheep husbandry—extensive areas of cheap, elevated lands, covered with natural grasses; broad plains suited for root culture; short winters and a comparatively dry climate, with nearness to markets.

Experience has shown that lambs can be raised in Virginia, in the spring, and sent to the great Northern markets long before they can be put there from the farms nearer; consequently good prices can be realized. The low priced lands of Tidewater and Middle Virginia are especially well situated for thus supplying early lambs, and large areas there are well adapted to the growing of swedes, mangolds and other crops that are so extensively cultivated in England and elsewhere for fattening sheep.

Angora Goats have been successfully and profitably raised in Piedmont and Middle Virginia, furnishing large fleeces of the valuable cashmere wool.

Bees find in the sections of this State an abundant flora, and the long and comparatively dry seasons are peculiarly favorable for apiculture; especially does this seem to be the case in Piedmont, where large profits are reaped by those that have given some attention to this pleasant home industry.

Swine are easily and cheaply raised in all portions of Virginia, especially in the portions abounding in forests, where they subsist much of the year on the nuts of the beech, oak, chestnut and other trees, at no cost to their owners; in fact, they are often fattened entirely on "mast." These animals can be reared more cheaply here than in almost any other part of the country; consequently they are kept in large numbers, and "Virginia bacon" has a valuable reputation in the markets. The climate is credited with aiding in the "cure" of hog meat.

Stock and *Beef Cattle*—the "other cattle" of the census—including all horned cattle, except milch cows and working oxen, are reared in large numbers in all parts of Virginia, but especially in Piedmont, the Blue Ridge, the Valley and Apalachia, where stock raising is an important and profitable branch of husbandry. Large numbers of fat cattle are annually sent to the Eastern markets from the rich grass lands of the sections named, especially from the portions where the nutritious and fattening "blue grass" grows. Many young stock cattle are also sold to the farmers of the country near the large cities, where they are stall fed.

There are vast tracts of mountain lands in Virginia that furnish a "range" for young cattle, enabling the grazier to rear them at but little expense. These tracts of land are covered by a growth of timber, more or less heavy, beneath which is an undergrowth of rich weed, wild grasses, &c., that are highly nutritious, and on which cattle can subsist from April to November. The stock raising capacity of the State can hardly be estimated, so great is it.

The *Scale* and *Shell Fish* of Virginia furnish not only a large portion of the animal food of thousands of the people of Virginia, especially in the Tidewater country, but immense numbers are taken from the waters of this and shipped to other States.

The thousands of square miles of Virginia territory covered by tidal waters abound, in the proper seasons, in shad, herring, rock, perch, sturgeon, sheep's-head, bass, chub, spots, hogfish, trout, tailor, Spanish mackerel and other fish, besides crabs, lobsters, terrapins, &c. The fishing season opens early, and while the waters near New York, Philadelphia, and other cities in a higher latitude are yet frozen, the shad and other spring fish can be caught in Virginia waters and sent to Northern and Northwestern markets, where they command high prices. Many of the fresh water streams of the State abound in many kind of fish, and both the State and the United States authorities are stocking them with other varieties. No country has more or better streams for fish breeding.

Oysters are found in all the tributaries of Chesapeake Bay and along the Atlantic coast, giving to Tidewater an extensive territory where this valuable shell fish grows naturally and where it can be propagated and reared in almost any desired quantity.

An industry that is receiving some attention and will be largely developed, is the raising of oysters. For some years the supply of oysters from the Chesapeake has been growing less, and the demand increasing. Under the present system of depletion, the supply will soon be altogether inadequate to the demand, and prices will necessarily be higher even than at present, and the man who has a well-stocked "oyster shore" can always find ready sale for all his oysters at good prices. There is little expense attending the business, and the difference between the cost of the oysters

"bedded" when small, and the price realized for them as "cove" oysters a year or so afterwards, will leave a wide margin of profit. There is no reason why the artificial propagation of oysters should not be conducted on an extensive scale. In France there are oyster farms that pays an annual profit of $500 to $600 an acre.

Birds for food are abundant, especially water fowl, in the great marshes and rivers of Tidewater, where canvas-back, mallard, creek, red-head, bald-face, teal and other ducks, geese, swans, sora, &c., swarm abundantly. In all portions of the State are found partridges or quails, pigeons, wild doves, grouse or pheasants, wild turkeys and other game birds.

Wild Deer are found in all portions of the State, especially in Tidewater and the Middle and Mountain sections.

The statistics give Virginia most ample resources of animal food, sufficient for a population many times as numerous as she now has. Nowhere is this kind of food better or cheaper.

This State has always been noted for the general excellence of the horses and mules bred in it, and it is well known that they can be reared cheaply in almost any section.

VEGETABLE PRODUCTIONS.—Virginia has a rich and abundant native flora, and the introduced plants, the cereals, grasses and others, that in temperate climates are objects of cultivation, here have found favorable soils and congenial climates. Here grow and yield abundantly the "plants good for food" both for man and beast, and those employed in manufactures. Timber trees of many kinds abound in all sections of the State.

A comparison of the production of cereals with any other country presents Virginia in a most favorable light as a grain-producing region, while nearness to markets adds largely to the value of the products.

Indian Corn is the staple bread grain of most sections of the State, except the Valley; the laboring rural population, in many portions, use it almost exclusively.

In Tidewater both *sweet* and *Irish potatoes* are a staple crop, the former having a high reputation in market for their superior quality; the latter are sent to market very early in the season. Except in Tidewater section, where market gardening has become a leading industry, potatoes, as a rule, are only raised in Virginia for family consumption; they are not fed to stock, nor, except from Tidewater, sent to distant markets. There is no question but that more use should be made of this prolific and easily raised article of human and animal food.

Peas and *Beans* are not cultivated in Virginia to the extent they should be when account is taken of the large areas so admirably adapted to their cultivation, so much more so than to the production of maize, that requires a strong soil, which it rapidly exhausts. Only in Tidewater and parts of Middle Virginia are peas and beans farm products.

Oats and *Barley*, cereals not used here for human food, are important Virginia crops, especially the former. Barley is only cultivated to a limited extent, though it always does well, and it could be most advantageously grown for exportation, since the climate would give it generally the quality it has only in occasional seasons in England, when it bears a high price.

The products of orchards and market gardens in Virginia are large and valuable, much more so than is indicated by the returns of the census.

Every portion of the State is remarkably well adapted to the growth of fruits of the warm-temperate and temperate climates.

In Tidewater Virginia, apples, pears, peaches, quinces, plums, cherries, nectarines, grapes, figs, strawberries, raspberries, gooseberries, currants and other fruits thrive and produce abundantly, the quality of the products being unsurpassed, as the award of the American Pomological Society attest. The value of the small fruits alone annually sent to market from Tidewater is more than the sums for orchards and gardens. The trade in early strawberries is one of large proportions. Especial mention should be made of the wild Scuppernong grapes, peculiar to the Tidewater Country near the sea, which spread over the forests and bear large crops of excellent fruit, from which a very palatable wine is made. The originals of the Catawba, Norton's Virginia and other esteemed American grapes grow wild in the forests of Virginia.

All the fruits named above grow in every section of the State, except, perhaps, figs. Piedmont, the Blue Ridge and the Valley are famous apple regions. Peaches flourish in all sections, but Middle and Tidewater may claim some precedence in adaptability. The Blue Ridge is entitled to the name of the "fruit belt," and its extensive area is yet to become the most noted wine and fruit-producing section of the United States east of the Rocky Mountains. All the fruits of Virginia flourish there in a remarkable manner, and find special adaptations of soil, climate and exposure.

No country can be better situated for market gardening than Tidewater Virginia. It is from 14 to 36 hours by water from Baltimore, Washington, Philadelphia, New York and Boston, the centres of population of the Atlantic slope of the United States. At the same time, its seasons are from one to two months earlier, giving an advantage of fully a double price for its garden products over the country in the vicinity of those cities.

The home gardens are not considered in any of the "returns" of the productions of Virginia, where potatoes, Irish and sweet, corn, peas, beans, onions, beets, parsnips, radishes, lettuce, celery, salsify, asparagus, melons and squashes of numerous kinds, carrots, okra, tomatoes, &c., &c., are raised in the greatest abundance, and form a portion of the daily food of the entire population.

The *Peanut* is extensively cultivated in Tidewater. Isle of Wight, Surry and Sussex are very notable counties for production of peanuts. Sandy and light soils are suited to their growth.

Vegetable Sweets are produced in Virginia from the sugar maple and the Chinese sugar-cane.

The *Wine* crop of Virginia is a small one, compared with the extensive territory here found that is especially adapted to the growth of the vine, both by the character of the soil and the conditions of the climate. Fully 2,000,000 acres of land in Virginia have soils and exposures similar to those of the most noted wine-producing sections of Europe, and the seasons are so long that the grape has ample time to fully mature and develop its natural juices, fitting them for the manufacture of pure wine. Experience has shown that the vines here grown are free from diseases, and that they may be relied on for abundant crops.

The Blue Ridge offers great advantages for viticulture. One vineyard on it in Warren County of 75 acres produces from 20,000 to 30,000 gallons of wine and from 6,000 to 10,000 gallons of brandy annually, the yield being from 300 to 500 gallons per acre. The "red lands" of the Piedmont Section are famous for their fitness for this pleasant and profitable industry. There are many localities in the other sections of the State where the vine flourishes. Early grapes are sent in considerable quantities from Virginia to Northern and Eastern markets. Mention has been made of the Scuppernong grape of Tidewater, marvellous for the space a single vine will cover and the quantity of fruit and wine it will produce. There is no more inviting field for the vigneron than Virginia.

Tobacco is a staple product of Virginia. The "Virginia Leaf" is noted the world over for its excellence, the result of manipulation as well as of soil and climate. The soils of the Piedmont and the Middle Sections are among the best for the growth of good tobacco; those of Middle produce the finest and most valuable. Tidewater is the region for Cuba and Latukiah varieties, while immense crops of coarse and heavy tobaccos are grown on the rich lands of the Blue Ridge, the Valley and Apalachia.

It should be noted that tobacco culture is not an exclusive one in any part of Virginia. Large crops of grain and roots are raised on the same plantations.

Cotton is grown in the southeastern counties of Virginia, between the James River and the North Carolina line. The State ranks twelfth in cotton production, the census of 1880 showing an annual product of 19,595 bales.

Grass is one of the abundant productions of Virginia, much of its territory being inside the limits of "natural grasses," and all of it is adapted to the vigorous growth of the "artificial" or cultivated ones. But the character of its climate does not require a large stowing away of hay; therefore it does not "figure" largely in the returns. A reference to the number of cattle in each section of the State makes the quantity of hay produced appear very small in proportion, but it shows that the pastures can be relied on for most of the year, owing to the mildness of the climate, greatly to the advantage of the stock feeder. It is true that a large quantity of long forage is obtained from the "tops, blades and stalks" of Indian corn, which, where this is a staple crop, take the place of hay for home consumption, and leave the hay for market, if desired.

Fine crops of hay are made from cultivated grasses in all portions of the State, but the natural meadows are mostly in Piedmont, Blue Ridge, the Valley and Apalachia. The "Hay Map" of the Statistical Atlas of the United States shades these sections the same as it does most of Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Missouri, &c., and as more productive than most of Tennessee and Kentucky.

The perennial grasses of Piedmont, the Blue Ridge, the Valley and Apalachia, including the noted "blue grass," are famed for their nutritious and fattening qualities, and place these among the most highly favored grazing regions in the world. Nowhere, save on the great plains of Texas and the extreme West, or South America, can cattle be reared and fattened more cheaply than in these sections of Virginia, as has been proven by the investigations of the United States Department of Agriculture. The Valley leads in the production of hay and seeds; Piedmont follows. The meadows of the low country in Virginia have an advantage in the early "haying" time, and where not too remote from the great cities, much profit can be gained by being early in market. Tidewater and Middle Virginia have many fine alluvial meadows, and the salt marshes of the former yield fine crops of hay and perpetual pastures.

The crops of clover and grass seeds are unusually large where they are made an object; the long seasons seem to give a larger yield of good seed. The first crop of clover for the year is generally cut for hay—it has so large a growth; and seed is taken from the less rank second growth.

Flax grows well in all portions of Virginia, though little attention is now given to its cultivation. The elevated mountain valleys suit it admirably.

Castor Beans are raised in considerable quantities, especially on the Eastern Shore of Tidewater.

The warm thin lands of Tidewater and the Middle country offer many advantages for growing *Garden Herbs* and *Perfumery Plants* and *Shrubs* on an extensive scale—the requisite heat and dryness of climate can there be found.

Hops are only raised for domestic use, except in a few cases. When planted the vines grow luxuriantly and bear well.

Large areas of land, similar to the hop lands of Kent, in England, and to those of the State of New York, can be found in Virginia, and hop culture could be advantageously undertaken in many localities, to vary the industrial productions.

Ramie and *Jute*, most valuable textile plants, could, without doubt, be most advantageously and successfully cultivated on the deep and rich second bottoms and reclaimed swamp lands of Tidewater. Ramie is a perennial, and the stalks are cut three or four times in a year. Millions of bales of jute are now annually consumed in the manufacture of paper, gunny-bags, grain sacks, &c.

The products of the forests of Virginia are large, varied and important.

TIDEWATER VIRGINIA has extensive forests of pine (the noted yellow Virginia,) oak, cypress, cedar, locust, &c., from which large quantities of sawed lumber and timber, staves, heading, hoop-poles, shingles, railway ties, fire wood, &c., are constantly shipped, very often from the edges of the forests, since sailing vessels can penetrate all portions of the section—directly to all the seaboard markets of the country. Sumac is here an abundant shrub.

The MIDDLE SECTION has large areas of superior hard pine, black, white and other oaks, hickory, locust, persimmon, gum, cedar, holly and other trees, from which much excellent lumber, tan bark, &c., are sent over the railways and canals that penetrate and cross it to various markets. Sassafras and sumac are plentiful, and the former could advantageously be made a staple crop on the ridge lands.

PIEDMONT has considerable forest land with many varieties of oak, hickory, tulip-poplar, black walnut, locust, cedar, chestnut, pine, and other timber trees, but it can hardly be considered a source of supply for timber for exportation, save in a few localities. Sumac and Sassafras abound.

The BLUE RIDGE is mostly covered with forests of oak, white, black, red, rock, &c., hickory, chestnut, locust, birch, some excellent yellow pines, and other trees. This section has furnished great quantities of charcoal for the manufacture of iron from the ores of its western margin, and it will long be a source of supply, so rapidly do its forests renew themselves. The timber supply of pine and other woods for the eastern part of the Valley is drawn from the Blue Ridge. Here is found much valuable hard wood, as hickory and oak for wagon and agricultural implement making. This is yet to become a most important source of supply for oak tanbark to convert into quercitron for exportation, or to be used in the country for tanning. Almost any quantity of oak bark can be obtained from this extensive range.

The VALLEY has nearly half its surface covered by a growth of oaks, hickories and locusts, interspersed with black and white walnuts, yellow and other pines, all having a uniform age of 150 to 200 years. This timber, while not the largest, is of the very best quality, and no well settled portion of the Union can offer a larger quantity of timber suitable for wagon, carriage, railroad car, cabinet and other work, for which hard, sound and durable woods are required. The slaty lands abound in sumac.

The APALACHIAN COUNTRY is both rich and poor in forestal wealth. On the sandstone mountain ranges, and in the slate and shale valleys, the trees are small but the growth is dense, consisting of oaks and other hard woods, pines, &c., good for charcoal, with larger trees in the hollows and more fertile spots. On the limestone ridges and adjacent valleys, as also in the calcareous and some shale valleys, on the other hand, the oaks, walnuts, white and yellow tulip-poplars, birches, beeches, locusts, cherries, sycamores, and other timber trees, are found of a sound growth and very large size, often several feet in diameter, straight and without a limb for fifty to eighty feet from the ground. Only portions of this region have been reached by railroads, and extensive forests of the best of timber for nearly all purposes await the progress of internal improvements and future demands. There are some extensive forests of white pine and of the more common varieties of the fir tribe, but generally the Coniferæ, suitable for timber, are not abundant in the forests of this section. It is fortunate that there is so much excellent coaling timber here in the vicinity of large deposits of easily fused ores of iron. It is from these mountain forests that ginseng, snake root, sarsaparilla and other medical plants are obtained.

Forest Fruits, such as blackberries, whortleberries, cranberries, strawberries, dewberries, haws, persimmons, service berries, thorn and crab apples, wild plums and cherries, are found in boundless abundance in nearly all the unoccupied lands and in the forests of Virginia, where, in

their season, they may be had for the picking by any one that is inclined to gather them. Not only are thousands of bushels of these wild fruits annually gathered for home use and sale in home markets, but they are dried or canned for exportation, furnishing important and valuable articles of commerce.

Nuts are found in all sections, embracing chestnuts, chinquapins, black walnuts, white walnuts, or butter nuts, hickory nuts of several kinds, hazel nuts, beech nuts, acorns of many varieties, &c.

MINERALS.

The mineral resources of the State may be summed up as consisting—

In TIDEWATER VIRGINIA—of several kinds of marls, greensand, &c., highly esteemed as fertilizers; of choice clays, sands and shell-limestones, for building purposes.

In the MIDDLE SECTION—of fine granites, gneiss, brownstone, sandstone, brick-clays, fire-clays, soapstones, marble, slates, &c., for building materials; epidote in various forms and limestone for fertilizing uses; gold, silver, copper, specular, magnetic, hematite and other ores of iron in abundance; bituminous coal, &c.

In PIEDMONT VIRGINIA—granitic building stones, marbles, sandstones, brick and fire-clays, epidotic rocks and limestone, for improving the soil; magnetic, hematite and other ores of iron; barytes, lead, manganese, &c.

In the BLUE RIDGE DISTRICT—various and abundant ores of copper; immense deposits of specular and brown hematite and other iron ores; greenstone rocks, rich in all the elements of fertility; sandstones and freestones; glass sand and manganese; brick and fire-clays.

In the VALLEY—limestones of all kinds, for building and agricultural uses; marbles, slates, freestones and sandstones; brick and fire-clays, kaolin, barytes; hematite iron ores, lead and zinc in abundance; semi-anthracite coal, travertine marls, &c.

In the APALACHIAN COUNTRY—limestones, marbles, sand and freestones; slates, calcerous marls, brick clays, &c.; various deposits of red, brown and other ores of iron, plaster, salt, &c., and a large area of all varieties of bituminous coal.

COAL.

Prion to 1883 comparatively little coal was mined in Virginia, the output of 1880 being less than 50,000 tons, but during that year the Flat Top coal regions were opened up mainly by the Southwest Virginia Improvement Company, the Norfolk & Western Railroad having been extended to this section. In 1883 this company mined 99,871 tons of coal, and in 1884, 283,252 tons. There are now several other companies developing coal mines in the same territory, and the prospects are good for a very important coal mining interest growing up in that section. The coal is of excellent quality both for steam purposes and for coke making, and as the Norfolk & Western Railroad Company have built at Norfolk, Va., one of the largest coal piers in the world for shipping this coal, there is no doubt that there will be a large increase in the amount of coal produced at these mines during the next few years. This will naturally result in making Norfolk an important coal shipping port, and coaling station for foreign steamships. The distance from these mines to Norfolk is about 378 miles. For coking purposes, this coal, as already stated, has proved very satisfactory, and Col. D. F. Houston, the general manager of the Crozer Steel and Iron Company's 100 ton furnace at Roanoke, writing of it, says: "We have been using coke made from the Flat Top coal at Pocahontas for the past ten months, and find it equal to Connellsville coke, which we used the first two months of our blast."

This is of great importance in the future development of Southwest Virginia as an iron making region, as it brings the necessary cheap and good fuel within convenient distance of the large supplies of iron ore accessible on New River, Cripple Creek and elsewhere.

It may with safety be predicted that in a few years Virginia will take an important rank as a coal producing State. And she will moreover have two

important coal ports: Norfolk receiving and shipping the steadily increasing quantity of coal brought from the Flat Top coal field by the Norfolk & Western Railroad, and Newport News, already doing a heavy business in West Virginia coal mined along the line of the Chesapeake & Ohio Railroad, and carried by that road to tidewater at Newport News.

The shipments of coal and coke transported over the Norfolk & Western Railroad since the completion of their New River Division to the Pocahontas Flat Top coal fields have been as follows:

	Coal. Net Tons.	Coke. Net Tons.
1882	4,735	.....
1883	82,043	23,762
1884	215,818	56,360
1885	603,116	48,571
1886	870,614	59,021
1887	1,157,423	151,171
1888	1,567,983	202,868
1889	1 813,745	310,504
1890	2,044,567	433,319

IRON ORE.

In writing of the iron-ore resources of Southwest Virginia, Mr. Andrew McCreath, in his "Mineral Wealth of Virginia," says:

"The most important development of the brown hematite ores along the Norfolk & Western Railroad system, and, considering their richness and character, one of the most important in the country, is the great iron-ore belt which is opened up by the Cripple Creek extension. The railroad passes for miles through rich outcrops of iron ore, with numerous mines now opened and worked to supply the small charcoal furnaces of the region.

"This iron-ore region is for the most part embraced in Pulaski, Wythe and Smyth Counties, in Southwest Virginia. The ores lie on both sides of New River and Cripple Creek, and the railroad line following these streams renders the whole ore supply practically available for market.

"The limestone ores of the Cripple Creek region show as high a general character as any brown hematite ores mined in the country. The result of numerous analyses shows an average richness in metallic iron of over 54 per cent. in the ore dried at 212° F., with about one-tenth of one per cent. of phosphorus. This unusually fine character is found to be very uniform through all the numerous mines and outcrops examined. It is somewhat extraordinary that not only is there this regularity in the percentage of iron, but also that the phosphorus shows a great uniformity in specimens taken widely apart; and in no case has it been found to exceed two-tenths of one per cent. The quality of the ore is such that it smelts very easily in the furnace, and it should require a minimum amount of both flux and fuel.

"The mountain ores of the Cripple Creek region have been but little worked, owing to the greater accessibility of the limestone deposits.

"Geologically, these mountain ores represent the same horizon as those which have been extensively worked in numerous other places, which have so frequently afforded large quantities of good ore, and which are now furnishing the regular supplies to the Crozer Furnace at Roanoke and to the Gem Furnace at Milnes.

"The quantity of iron ore in the Cripple Creek region is undoubtedly very great. The limestone deposits occur in clefts and cavities of the limestone mixed with clay, but in this district rarely with any flint. The method of occurrence is such that the banks will yield widely varying quantities of ore. Some of them have been worked for many years, and shafts are reported to have been sunk 100 feet in ore-bearing clays with bottom of shaft still in ore. Frequently the ore-bearing material is of unusual richness, yielding in the washer fully one-half clean ore.

"The developed mines represent but a part of the limestone ore deposits, as there are numerous rich and widely extended outcrops of iron ore which have either as yet never been tested, or else only a few shallow pits have been sunk just sufficient to show that the ore continues below the surface, without determining its depth.

"Facilities for economical mining are posessed by this region in a marked degree, for the limestone ores are very free from flint, and are

generally found in a loose granular clay which is easily washed out; there is abundance of water for washing purposes, both in the branch streams and in Cripple Creek itself; the ore deposits are geographically and topographically well situated for mining, and the ore-bearing material is frequently of unusual richness. As a result of all these favorable circumstances, the region is to-day producing very cheap limestone ore, and the amount of such cheap limestone ore can be quickly and largely increased. It is safe to say that the district can compare favorably in the cost of production with any other brown hematite iron ore producing region."

Since the publication of McCreath's "Mineral Wealth of Virginia" another and more complete report has been compiled and published by Messrs. McCreath & d'Invilliers, under the title of "The New River—Cripple Creek Mineral Region of Virginia," which gives more fully the analyses of iron and zinc ores, and a complete description, with maps, etc., of all the properties in that region; also the analyses of the Pocahontas Flat Top coal and coke. Copies of this report can be obtained by addressing F. J. Kimball, president Norfolk & Western Railroad, 333 Walnut street, Philadelphia, Pa., or Chas. G. Eddy, vice-president, Roanoke, Va.

PIG IRON.

The production of pig iron in Virginia has shown a very rapid increase during the last five years. The advantages posessed by that State for making iron are probably not surpassed by any other section of our country, when the cost, transportation facilities and nearness to consuming markets are taken into account. Since 1880 Virginia has increased her production of pig iron from 29,934 tons to 157,483 tons—a rate of increase that is surprisingly large. The gain has been steady from year to year without any fluctuation. In 1880 the production was 29,934 tons; in 1881, 83,711 tons; in 1882, 87,731 tons; in 1883, 152,907, and in 1884, 157,483 tons, showing an increase in 1884 even, as compared with 1883, notwithstanding the fact that the aggregate production of pig iron in the whole country in 1884 was 557,000 tons less than in 1883, owing to the general industrial depression. The cost of making pig iron in the South is a much disputed question. There are some who claim that it can be produced at extremely low figures, even $8 and $9 a ton being often mentioned, while others are equally as positive that the cost is much greater. In the first class there are probably some who are interested either in selling mineral lands or in seeking to develop some special locality, while among the second class would doubtless be found some who have private reasons for making the cost appear larger than it really is. There is, however, a middle ground which will bring us very near to the truth. Probably the most reliable and unbiased statements regarding the cost of pig iron making in Virginia are those of Prof. McCreath, already quoted. Prof. McCreath is chemist to the State Geological Survey of Pennsylvania, and consequently can hardly be accused of being partial to Virginia; moreover, he was recommended for this work by many of the leading iron makers of Pennsylvania. After a thorough examination, he submitted the following estimates as to the cost of making pig iron in Virginia and in Pennsylvania:

Cost of Making Iron in Virginia.

	AT MILNES.	BUCHANAN.	ROANOKE.	PULASKI.	CRIPPLE CREEK.
Ore	$ 4 50	$ 4 73	$ 4 79	$ 4 79	$ 3 40
Coke	5 25	4 46	3 69	3 31	3 88
Limestone	30	60	75	60	50
Labor	1 50	2 00	2 10	2 00	2 00
Incidentals	1,00	1 25	1 25	1 25	1 25
Total cost per ton	$12 55	$13 04	$12 58	$11 95	$11 03

Cost of Making Iron in Pennsylvania.

	MIDDLE PENNSYLVANIA.	HARRISBURG.	LOWER SUSQUEHANNA.	LEHIGH VALLEY.	PITTSBURGH.
Ore	$ 7 75	$ 7 50	$ 7 25	$ 8 00	$10 00
Fuel, coal and coke.	4 62	4 50	4 95	5 00	3 00
Limestone	1 00	85	56	77	77
Labor, Incidentals.	3 25	3 25	3 25	3 25	3 25
Total cost per ton.	$16 62	$16 10	$16 01	$17 02	$17 02

The figures for Milnes, Virginia, are the *actual* cost of making coke pig iron at the large furnace located there; and while the figures for Roanoke were given when made as estimates, they are confirmed by the general manager of the Crozer Steel and Iron Company of Roanoke, who puts the actual cost at his furnace at $12.60. It is possible—indeed, quite probable—that the economies lately introduced into iron making, forced, as they were, upon furnace owners by the extreme depression of 1884, have made somewhat of a reduction from the foregoing figures as to the cost of iron making in Virginia. Prior to the severe business depression that at this writing appears to be passing away, a large number of companies had been organized and chartered to erect furnaces in different parts of Virginia, and but for this depression, probably half a dozen large furnaces of an aggregate capacity of 150,000 to 200,000 tons annually would now be under construction in that State. These companies having their charters already secured, will no doubt take advantage of the first decided improvement in the iron trade and commence the erection of their furnaces, and thus add to the steadily increasing production of pig iron in Virginia.

The shipments of pig iron, iron ore and manganese transported over the Norfolk & Western Railroad for a series of years were as follows:

	Pig Iron, Net Tons.	Iron Ore, Net Tons.	Manganese, Net Tons.
1881	8,985	3,639	1,879
1882	13,372	1,399	1,648
1883	24 611	51,915	125
1884	28,591	49,302	386
1885	23 209	60,825	1,168
1886	34,917	65 851	256
1887	46,642	128,696	762
1888	95,389	195,350	563
1889	161,215	249,374	152
1890	142,876	390,237	825

MANUFACTURES.

In the amount of capital invested in manufactures, Virginia at the taking of the census in 1880, was surpassed by only two of the Southern States—Maryland and Kentucky. Next to Virginia came Georgia with $20,672,410 invested in manufacturing, against $26,968,990 in the former State. In 1880 Virginia had 5,710 manufacturing establishments, employing 30,184 hands, and producing manufactured products to the extent of $51,780,992. These figures, however, give but little idea as to the extent of manufactures in this State at present, as the last four years have been very active ones in the building up of the industrial interests of Virginia. In 1880 for instance, Virginia produced only 29,943 tons of pig iron, while in 1884 nearly 153,000 tons were made in that State; in 1880 the cotton mills of the State had 44,000 spindles, while in 1884 they had 66,000. These are but illustrations of the general industrial progress of Virginia, though possibly in other interests the development has been somewhat less rapid. It has lately been stated by a good authority that in one county alone $5,000,000 has been invested in manufacturing and mining industries during the last ten years, and of this the bulk has been invested since 1880. In the manufacture of tobacco Virginia takes a high rank, the product of her immense tobacco factories being found in nearly if not every civilized country of the world. As in North Carolina, this business is rapidly increasing, and lately a number of important tobacco manufacturing enterprises have been organized in the State. The flour milling interest is a very large and flourishing one, the excellent quality of Virginia wheat enabling the millers to produce a superior quality of flour in much demand outside of the State, and especially in South America, where very large quantities of Richmond flour are annually consumed.

The manufacture of machinery is probably carried on more extensively in Virginia than in any of the other Southern States, excepting Maryland and possibly Kentucky, though it is impossible to give any statistics on this, later than the census reports of 1880, and they are of little value so far as the present industrial position of the Southern States is concerned. At Richmond and Roanoke there are machine shops of enormous size and capacity, equalling in extent and in the character of the work turned out, the largest machine shops to be found in the North. These shops not only

make the general run of machinery such as engines, boilers, saw mills, &c., but they also do a very large amount of railroad work, some of the locomotives manufactured by them being equal to the best made. In nearly all portions of the State manufactures are receiving increased attention, and strong efforts are made by the press and the people to encourage the manufacturing interests.

OYSTER INTERESTS.

In the Chesapeake Bay and its tributaries, Maryland and Virginia have a magnificent source of wealth. This bay has long been noted as containing the most extensive and valuable oyster beds in the world. It is true that these oyster beds are gradually being depleted by excessive dredging; but as this will drive the oystermen into the regular cultivation of oysters, and thus increase their profits and enlarge the annual yield, it can hardly be looked upon as a permanent injury to the State. There are few industries of any kind that offer larger returns for the capital invested and are as safe and secure as oyster planting. It is an industry which needs only a moderate amount of attention, and does not require any special training or education, and yet, if intelligently managed, will almost certainly yield very liberal profits. The oyster planters of the Chesapeake almost without exception find their business profitable. It is a business in which either large or small capital can be invested to advantage—the rate of profit probably being very nearly the same in either case.

In 1880, Mr. R. H. Edmonds, editor of the Manufacturers' Record, Baltimore, at the request of the United Census Department, prepared a report for the census upon the "Oyster Interests of the Chesapeake Bay," from which the following statistics are gathered: There are 14,236 men engaged in catching oysters in Virginia, using in their work 4,481 canoes or small boats averaging about two men each, and 1,317 larger boats running from 10 to 20 tons each and employing on the average about four men each. Of the aggregate number of oystermen, 6,538 are white and 7,698 colored. The total value of the boats engaged in this business in Virginia is $790,200. There were in 1880 twenty-five firms in Virginia engaged in canning oysters, their capital being $119,350. They handled in that year 1,622,130 bushels of oysters, valued at $726,693. The total quantity of oysters taken in Virginia waters for the census year was 6,837 320 bushels. The aggregate amount of capital invested in all branches of this business was $1,361,100; the number of people employed, 16,264, and their wages and earnings were $3,125,923.

EDUCATIONAL FACILITIES.

The State has an excellent system of public schools, as complete, except in thinly-settled districts, as in any other State. Private schools, academies and colleges are numerous. The University of Virginia, near Charlottesville, ranks with the best universities in the country. The Washington and Lee University and Virginia Military Institute are colleges of high grade.

TRANSPORTATION.

Virginia is well supplied with transportation facilities. The State has a large railroad mileage, and through its enormous extent of water front along the Chesapeake Bay and its numberless tributaries, the whole of Tidewater Virginia is kept in close and cheap communication with leading markets by means of steamboats and sailing vessels.

MINERAL WATERS.

Virginia has for years been famous the world over for the number and value of her mineral springs. In the western section of the State there is hardly a neighborhood without its springs of mineral water. There is probably no other State in the Union possessing so many popular resorts. The people not only of the South, but of the North and West as well, gather at these springs in the summer in enormous numbers to drink the health-giving waters and breathe the invigorating mountain air. The furnishing of farm products to the hotels is a profitable business for the local farmers and truck raisers.

Virginia offers many inducements to the investor and the settler, and her advantages for industrial or agricultural pursuits and her attractions as a place of residence are well worth investigation.

"GO SOUTH, YOUNG MAN."

The Honorable Chauncey M. Depew, in an Address to the Alumni Association of Yale University, Said of His Recent Tour Through the Southern States:

"The net result of this visit to the South, to my mind, is just this—that THE SOUTH IS THE BONANZA OF THE FUTURE. We have developed all the great and sudden opportunities for wealth—or most of them—in the Northwestern States and on the Pacific Slope, but here is a vast country WITH THE BEST CLIMATE IN THE WORLD, with conditions of health which are absolutely unparalleled—with vast forests untouched, with enormous veins of coal and iron which yet have not known anything beyond their original conditions, with soil that, under proper cultivation, for little capital can support a tremendous population; with conditions in the atmosphere for comfortable living winter and summer, which exists nowhere else in the country; and that is to be the attraction for the young men who go out from the farms to seek settlement, and not by immigration from abroad, for I do not think they will go that way, but by the internal immigration from our own country it is to become in time as prosperous as any other section of the conntry, and as PROSPEROUS BY A PURELY AMERICAN DEVELOPMENT."

GO TO VIRGINIA

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WHERE THE OPPORTUNITIES ARE THE GREATEST.
WHERE ALL ARE WELCOME.

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From the West —Go via Louisville, Ky., or Cincinnati, Ohio, or via Columbus, Ohio.

For all information, maps, reference book, pamphlets, etc., descriptive of the wonderful mineral and agricultural resources of the State, apply to Agents of the Norfolk & Western Railroad, 290 Washington Street, Boston; 303 Broadway, New York; 1433 Pennsylvania Avenue, Washington; 67 East State Street, Columbus, Ohio; or General Office, Roanoke, Va.

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